# Understanding the Antecedents and Relational Qualities of Environmental Collaboration in a Supply Chain Network in the Furniture Industry

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*“The most complete gift of God is a life based on knowledge”, - Imam Ali (AS)*

# Abstract

Environmental collaboration means the direct involvement of supply chain partners in jointly planning for environmental objectives (Vachon & Klassen, 2008). Addressing the environmental issues faced in the supply chain requires a network relational perspective that considers the diverse resources, capabilities and knowledge that already exist in the supply chain (Sheth & Parvatiyar, 2020). The supply chain literature identifies environmental collaboration as the fundamental process used to attain a green, sustainable supply chain and a circular economy (Dora, 2019). Nevertheless the literature calls for further exploration of the precursors, components and processes of environmental collaboration as it occurs as an extension of existing operational collaborations in a network of partnerships (Ahmed et al., 2020).

The theoretical contribution of this research is in two folds, firstly this research identifies the point at which existing the operational collaboration extends to environmental collaboration (Hazen, Russo, Confente, & Pellathy, 2020). Secondly, the resources, capabilities, and roles of the supply network as precursors and components needed during environmental collaborations emerged. Finally, the methodological contribution of this research is to explores environmental collaboration from a myriad of perspectives, rather than being bound by a focal organisation's experiences, resources, and capabilities. In which this research responds to the call in the available literature to further explore relational environmental collaboration through a qualitative lens (Ren et al., 2019). The selection of participants was based on the assumptions that first, the organisations that were proactively collaborating on environmental objectives were interviewed to understand the circumstances in which environmental collaboration has been adopted. Secondly, the partner's coordination and roles throughout environmental collaboration in the supply chain are explored. Finally, the relational qualities that influence the momentum of environmental collaboration throughout the network is explored. The theoretical underpinning of this research includes the Natural Resource Based View (Hart, 1995) and Interorganisational Relational View Theory (Dyer & Singh, 1998; Oliver, 1997). Both theories inform the relational investments, resources and capabilities needed for environmental collaboration in a network context to attain a competitive advantage.

This research adopts a qualitative and grounded theory research methodology design through a pragmatism theoretical philosophical lens. The pragmatic approach aids in exploring the undermining consequences, conditions, processes, and outcomes of environmental collaboration throughout the supply chain network. The themes that emerged through inductive thematic analysis and cross comparison from 21 semi structured interviews is comprised of retailers, manufacturers, suppliers, logistics staff and associations in the furniture Industry in Australia and New Zealand.

The precursors of environmental collaboration emerged as Green Organisational Orientation. The themes of a Green Organisational Orientation are having a green conscious leadership, forming a green organisation, and assessing plausible green practices. The components of environmental collaboration emerged as supply chain and industry level collaboration. The theme of supply chain environmental collaboration that is supported by the sub-themes of restructuring the supply network, coordinating environmental collaboration, and defining partner roles. Industrial environmental collaboration is supported by the sub-themes of environmental competition and the association's role in the wider industry. The relational factors that strengthen the environmental collaboration was supported by themes including establishing green supply alignments, exploring dynamic power asymmetries in the supply network, trust in the green supply alignments, communicating in a green supply network, transparency in sharing green resources and capabilities and authenticity in green supply alignments. The theoretical model built demonstrates the evolution of environmental collaboration as a non-linear process that is propelled by the Green Organisational Orientation towards supply chain and industry environmental collaboration. The relational factors strengthen the collaborative process within the supply network. But the environmental collaboration is further strengthened in terms of sustainable development through time.

**Key words:** Environmental Collaboration, Supply Chain, Green Organisation, Relational Factors, Furniture Industry, Qualitative, Grounded Theory, Thematic Analysis

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# Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

The following publications relate to work undertaken for this thesis:

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# Ethics Approval

Ethics approval from AUT University Ethics Committee (AUTEC) was granted on 29th August 2019 for a period of three years until 27 August 2022. The ethics application number is 19/296. (See Appendix G for Approval letter).

# Chapter 1 Introduction

Environmental damage caused by human activity is a well-established fact that has drawn the attention of NGO's, governments, organisations and communities (*The Heat is On: A world of climate promises not yet delivered*, 2021). Collaboration amongst various stakeholders is needed to mitigate the environmental damages facing the planet (*State of Global Climate 2021*, 2021). Therefore, this research seeks to understand the collaborative behaviour needed between organisations to pursue environmental objectives in their own practices, from a micro, meso and macro perspective. The resources and capabilities that are needed for an organisation to be more environmentally friendly is explored from a micro-organisational perspective. The environmental collaboration in a supply chain is explored from a meso perspective. At the macro perspective, the environmental collaboration in an industry is explored. Finally, the relational qualities that strengthen the collaborative behaviour within the relational network are explored.

Supply chains are taken as a context for this research because they are made up of organisations that are responsible for the procurement and distribution of commodities across the globe (Jraisat et al., 2021). Their global importance and disparity is responsible for 80% of carbon emissions, which increases the detrimental consequences of climate change (Sabuj, Ali, Hasan, & Paul, 2021). Hence, this research explores how organisations in the supply chain of the furniture industry can collaborate to jointly address environmental issues. The exploration takes a macro lens of the supply chain of the furniture industry by interviewing the supply networks that make up the furniture industry. The proceeding sections of this chapter summarise the theoretical underpinnings and methodology used to investigate this research phenomenon.

## 1.1 Scope of the Study

The pressure from NGOs and governments for supply chains to be sustainable has rapidly increased over time (*The Sustainable Development Goals Report 2021*, 2021). Global supply chains contribute considerably to the environment, hence United Nation designated a goal amongst the 17 sustainable development goals as responsible consumption and production(*Ensuring Sustainable Consumption and Production*

*Patterns*, 2021). The goals are targeted to be accomplished by 2030, which demonstrates the urgency at which governments like Australia and New Zealand need to attain sustainability in their supply chains (*Australia In-depth PESTLE Insights*, 2021; *New Zealand In-depth PESTLE Insights*, 2021).

The 12th sustainable development goal of responsible consumption and production focuses on making each stage of the supply chain environmentally friendly (*Making Peace with Nature: A scientific blueprint to tackle the climate, biodiversity and pollution emergencies.*, 2021). Therefore, the success of objective 12; the responsible consumption and production lies in the adoption of green practices by supply chains and through the increase demand of green products by consumers (Tian, Otchere, Coffie, Mensah, & Baku, 2021). Although the role of consumer's in terms of responsible consumption is evident (Tan, Johnstone, & Yang, 2021), responsible production is more influential in providing sustainable products for consumption (Asif, Lau, Nakandala, Fan, & Hurriyet, 2020). Essentially, a consumer's increasing demand for responsible consumption is highly dependent on the availability of green products in the market that are affordable (Huo, Gu, & Wang, 2019). Moreover by increasing responsible production, the variety of green products and services available as alternative choices for the customer increases green consumption, as decision making becomes easier (Sandberg, Klockars, & Wilén, 2019). Hence this research aims to address the challenges that organisations in the supply chain face in the pursuit of increasing green production through environmental collaboration.

From a supply chain perspective, International Organisation for Standardisation (ISO) provides frameworks for a myriad of benchmarks in the production of goods and services (Zimon, Madzik, & Sroufe, 2020). In relation to sustainable production the most used ISO standards are ISO20121 Sustainable events, ISO 14000 Family Environmental Management, ISO 5001 Energy Management, and ISO 26000 Social responsibility (Campos, de Melo Heizen, Verdinelli, & Cauchick Miguel, 2015; Zimon et al., 2020). The advantage of these standards is that they provide a unified benchmark for organisations to implement responsible production (Arimura, Darnall, Ganguli, & Katayama, 2016). Nevertheless, acquiring the standard requires a significant investment of time, money, and top management commitment, which can't be pursued by many small scale

organisations throughout the sub-tiers of the supply chain (Bastas & Liyanage, 2018). Given the importance of preserving the environment and attaining a responsible standard of production, this study aims to understand the supply networks' collaborative efforts in attaining its environmental objectives. The supply chain in the furniture industry in Australia and New Zealand has been taken as a context for this study. Hence, the distinctive scope of this study is centred on exploring environmental collaboration in supply chains in the furniture industry in Australia and New Zealand.

The context of this research is the furniture industry, which derives its raw materials from numerous natural resources including wood, metals, cane, leather, fabrics, and plastics (Wenker, Richter, & Rüter, 2018; Yue et al., 2020). Hence the supply chain for the furniture industry cross cuts across various industries and regions, and has a significant environmental impact (Sales-Vivó, Gil-Saura, & Gallarza, 2020). Globally every second $18000 (USD) of furniture products is bought (Profile, 2018). The Asia-Pacific region is the leading furniture producers in the world with 39% (256 million USD) market value, followed by North America 29% (212 million USD), Europe 28% (186 million USD), Middle East 2% and South Africa 2% (13 million USD) (Profile, 2018). In the Asia-Pacific region, Australia's estimated output is valued at 9.63 million dollars (USD) and New Zealand's estimated value in the market is 567 million Dollars (USD) (*Australia In-depth PESTLE Insights*, 2021; *New Zealand In-depth PESTLE Insights*, 2021). The primary industries contributing to the furniture industry also have significant value for both countries. The forestry industry contributes 1.65% of New Zealand's GDP, with a value of $6.7 billion (USD) being its 3rd largest primary industry(*New Zealand In-depth PESTLE Insights*, 2021). While Australia's value of forestry industry is $23.1 billion (USD)(*Australia In-depth PESTLE Insights*, 2021). From the metal industry Australia earns $29 billion (USD) and New Zealand $3.3 billion (USD) (*Australia In-depth PESTLE Insights*, 2021). Hence, the economic significance of the furniture industry for both countries is evident but comes with a multitude of environmental impacts (*Forest Products in Asia-Pacific*, 2014; *Home & Garden Product Retail in Australia*, 2021).

The environmental impact of the furniture made is divided into three categories, namely energy and raw materials the emission of chemical substances, and waste generation (Susanty et al., 2017). In the production phase the furniture industry derives from

various raw materials that influence significant environmental issues such as deforestation, hazardous waste, soil erosion and waste pollution (Arning, van Heek, & Ziefle, 2018; Kirschbaum, Saggar, Tate, Thakur, & Giltrap, 2013). Overall, the furniture industry is responsible for 40% of the waste of natural resources (Costa, Prendeville, Beverley, Teso, & Brooker, 2015; Hartini, Wicaksono, Prastawa, Hadyan, & Sriyanto, 2019). The most significant influence of the furniture industry is in the forestry industry, which is worth $500 million USD dollars, employing 54 million people worldwide (Marchi et al., 2018). The main drivers of deforestation are 41% beef production, 18% soya beans and palm oil and 13% logging, wood and paper products (Profile, 2018).

In comparison, nevertheless, the influence of the furniture industry is 13%, however the earth has already lost 80% of its forests and every year 28 million hectares are lost (Lambin et al., 2018; Yue et al., 2020). Studies indicate that wood derived from natural forest needs five times more land, 11 times more water, two times more fuel, 50% more lubricant and 30% more steel and rubber, which collectively accumulate to impact on air, water and waste pollution (Mäkelä, 2017; Wenker et al., 2018). Every year three trillion tons of hazardous waste is emitted, and nine million tons of furniture waste goes to landfills every year (*State of Global Climate 2021*, 2021).

The distribution of furniture products also has a major environmental impact (Report, 2017). Firstly, the procurement and manufacturing of furniture products are spatially distanced, which results in significant carbon emissions (Hartini et al., 2019; Susanty, Sari, Rinawati, Purwaningsih, & Sjawie, 2019). Secondly, the products are bulky and require more packaging waste for protection and bear significant load during freight (Warsito, Adi Wicaksono, Ahmad Kadafi, Sudarno, & Triadi Putranto, 2020). The carbon emitted from transporting one piece of furniture equals 47 kg of carbon dioxide, which is equivalent to burning 5.3 gallons of petrol (Warsito et al., 2020). Globally the furniture industry is responsible for 30% of all the carbon emissions produced by consumer products (Profile, 2018). From the consumption perspective, the furniture industry is the least recycled household item globally (Nordquist, Klang, & Holm, 2020). Hence it is evident that the furniture industry is a labour, energy and material intensive industry (Profile, 2018). Finally, since the supply chain of the furniture is dispersed spatially across

many regions, the social issues embedded in the sub-tiers of the supply chain are also significant (Tondolo, Deliberal, Camargo, & Tondolo, 2016).

Currently the furniture industry is facing an increase in customer demand for high quality and environmentally friendly products (Yun, Ling, Dongfeng, & Shuo, 2017). However, challenges exist for furniture companies to adopt a fully green sustainable supply chain, such as a lack of sustainably sourced raw materials, the costs, and the complication of harvesting wood. This includes price deductions due to competitive demand, high energy costs (Barni, Corti, Pedrazzoli, Rovere, & Lucisano, 2017), lack of skilled labour (Azizi, Mohebbi, & De Felice, 2016) the lack of eco-efficient processes and certifications, a lack of cleaner production processes and business models, a lack of solid waste management in pre and post production stages and the lack of consumer perception on the recycling of furniture products (Azizi et al., 2016; Oliveira, França, & Rangel, 2018).

Solutions to solve these challenges include partnerships with pollution prevention companies, research centres and the strengthening of communication channels with customers (Oliveira et al., 2018; Ruiqi, Wang, Xu, & Yuan, 2017). Further pathways to tackle waste management include inputting lower raw material per unit products, known as sustainable bio-economy, using technology to bridge the gap of customer perception about sustainability, and recycling and using technological innovation and tactical knowledge to educate local farmers and forest owners (Garcia & Coltre, 2017; Korhonen, Koskivaara, & Toppinen, 2018). If a furniture company overcomes these challenges, it will lead them towards increased product control through eco design, reduced operating costs, continuous product process improvement towards sustainable solutions, added knowledge and experience of technologies and components, improved product image, ethical purchasing, increased brand image and, finally, an improved local economy through domestic sourcing (Landeta-Manzano, Arana-Landín, RuizdeArbulo, & DíazdeBasurto, 2017). However such significant change requires the collaboration and coordination of the supply network (Sales-Vivó et al., 2020).

## 1.2 Research Background

Sustainability is defined as utilising current resources in a way that future generation's needs need not be compromised (Malviya, Kant, & Gupta, 2018; Verma, Dixit, & Singh, 2018). Sustainability in supply chains gained popularity in 2008, including practices that can be implemented in various functions of the supply chain such as sourcing, production, delivery, value proposition, customers, recycling, planning, execution, coordination, and collaborations that lead to sustainable performance (Hinterhuber, 2017; Katiyar, Meena, Barua, Tibrewala, & Kumar, 2018; Peyer, Balderjahn, Seegebarth, & Klemm, 2017). Among these functions, planning, sourcing, manufacturing, and delivery are identified as the core executing functions that impact sustainable performance (Katiyar et al., 2018). To attain a sustainable supply chain, the environmental, economic and social issues in the network have been considered (Habib et al., 2021).

However, adopting sustainable practices in the supply chain is challenging and costly (McDougall, Wagner, & MacBryde, 2021). Some of the identified key barriers are the high cost of environmental friendly packaging, maintaining economic growth, lack of CEO commitment, lack of measurement of practices, lack of knowledge about sustainability, uncertainty in the return on investment, the challenges of green product design, lack of sustainable expertise, costly logistic practices (Azizi et al., 2016; Scur & Barbosa, 2017; Tariq, Badir, Tariq, & Bhutta, 2017), the complex planning in the reduction in energy and consumption, the lack of sustainable regulations and benchmarks, the internal pressures from employee involvement and loyalty, the lack of sustainable missions and visions, the lack of company's ethics and values, and, finally the cost of implementing business information systems (Movahedipour, Zeng, Yang, & Wu, 2017; Roman Pais Seles et al., 2018). Besides the mentioned challenges the costs of implementing sustainable practices are high, which risks the organisations resources, its competitive advantage, and its economic position in the market (Jajja, Chatha, & Farooq, 2018). Furthermore, environmental, and social issues are often cross cutting issues that require partnerships to solve (Khan, Zkik, Belhadi, & Kamble, 2021; Shafiq, Ahmed, & Mahmoodi, 2020). Therefore, collaboration amongst the supply chain network is

considerably important to attain a sustainable supply chain management (Jraisat et al., 2021).

However, supply chain networks already collaborate, cooperate and partner for the operational and economic performance of the supply chain (Chen, Zhao, et al., 2017; Petljak, Zulauf, Štulec, Seuring, & Wagner, 2018). Collaboration for sustainable practices occurs as an extension to an existing operational collaboration (Ahmed et al., 2020). This research explores the point at which operational collaboration extends to environmental collaboration. Environmental collaboration that is the joint planning and attaining of green issues in the supply chain (Vachon & Klassen, 2008). Environmental collaboration is empirically explored as a mediator and moderator in achieving a green and sustainable supply chain and a circular economy (Liu, Feng, Zhu, & Sarkis, 2018; Wu & Lin, 2013).

During environmental collaboration, the boundaries of the supply chain provide scope and influence on the quality of jointly attaining green issues (Sarkis, 2012). These boundaries are ranked from sub micro to supra macro, which include individuals, groups and teams, functions or departments, organisations, the supply chain, industries, and global industrial networks (Sarkis, 2012; Sirikasemsuk & Luong, 2017). These boundaries provide further complexities to the supply network's ability to environmental collaborate and implement green practices (Sarkis, 2012). The inter- related boundaries extend to organisational, proximal, political, informational, temporal, legal, cultural, economic and technological areas (Sarkis, 2012; Tam, 2017). These boundaries are deemed to impact the application of green practices in terms of significance, importance and periods, which in turn impacts the company's materials, service, finances, information, and waste flows (Mrkajić, Stanisavljevic, Wang, Tomas, & Haro, 2018; Sarkis, 2012) as well as internal and external communications (Thunberg, Rudberg, & Karrbom Gustavsson, 2017; Trada & Goyal, 2017). Environmental collaboration occurs at a point of synchronisation of green practices, influenced by these boundaries and strengthened by relational bonds within the supply chain network (Zhao, Pan, & Song, 2018).

Furthermore, to understand environmental collaboration it is important to explore the motivations and capabilities that exist in the organisation to strive for collaborative

behaviour within the supply network (Jahanshahi & Brem, 2018). The literature identified the commitment of top management, green policy and environmental management systems as precursors of environmental collaboration (Latan, Jabbour, Lopes de Sousa Jabbour, Wamba, & Shahbaz, 2018). However, the literature does call for qualitative exploration to further the insights on the precursors of environmental collaboration (Lee & Joo, 2020). The motivation and intention that drives organisations to pursue environmental collaboration is important to understand, as it influences the amount of resources, capabilities and commitment that is invested in the many uncertainties and risks of pursuing green issues within the wider supply network (Govindan, Jha, Agarwal, & Darbari, 2019). Additionally, the internal resources, capabilities and commitment that need to be acquired by organisations needs to be further explored (Bouguerra, Gölgeci, Gligor, & Tatoglu, 2021). This is incremental, as environmental collaboration occurs as an extension of an existing operational supply chain collaboration that is detrimental to the economic performance of the supply network (Arora & Arora, 2020). Risking the economic viability of the supply network for uncertain and evolving green issues requires more investment in different stages of the supply chain, such as procurement, manufacturing, freight, distribution and more (Arora & Arora, 2020).

Finally, the environmental collaboration literature focuses on a quantitative empirical assessment of dyad and triad relationships in the supply network (Wong, Sinnandavar, & Soh, 2021). The environmental collaboration is mostly pursued from one partner's perspective as a focal company moderating or mentoring the collaboration with suppliers or customers (Green, Zelbst, Bhadauria, & Meacham, 2012). The focal companies that are most researched in the literature are manufacturers or 1st tier suppliers in various industries (Govindan et al., 2019; Sinkovics, Kuivalainen, & Roath, 2018). However, collaboration is a diverse process that needs unique commitment, resources and capabilities from various partners in the chain (Feng, Jiang, & Xu, 2020; Zhao, Li, Song, Li, & Wu, 2018). Hence the literature calls for environmental collaboration to be explored from multiple perspectives in a network of relationships to represent an existing supply network with a myriad of relationships across various regions and industries (Li, Qiao, Cui, & Wang, 2020).

Therefore, this research responds to this call and qualitatively explores environmental collaboration from a perspective of existing collaborative partners in a supply network in the furniture Industry. The relational factors that exist amongst the myriad of partnerships in the network influence the strength and performance outcome of the environmental collaboration process (Hingley, Lindgreen, & Grant, 2015; Salam, 2017). From a B2B relationship marketing literature it is evident that organisational and personal relational factors do bind the collaboration intentions amongst partners (Sheu, 2014; Talay, Oxborrow, & Brindley, 2020). Some relational factors explored from dyad and triad perspectives include trust (de Almeida, 2020), communication (Mendoza-Fong et al., 2018), power symmetry (Sun et al., 2019), transparency (Brun, Karaosman, & Barresi, 2020) and authenticity (Ranfagni & Guercini, 2014). However, it is important to further explore the relational factors in a network of relationships collaborating for green issues in an area of high uncertainty, costs, and risks (Laeequddin, Sahay, Sahay, & Waheed, 2011; Srinivasan, Mukherjee, & Gaur, 2011).

## 1.3 Research Problem, Questions and Aims

It is estimated that annually $2.2 trillion worth of environmental damage is caused by 3000 top global firms, with this amount equal to only one-third of their profits (Bofinger, 2016) while on the opposite side of the spectrum, green products make up only 4% of the total market share (Tseng & Hung, 2013). This indicates that there is a significant gap in the market that yearns for an increase in green production (Damert, Feng, Zhu, & Baumgartner, 2018). It is important for organisations to respond to these concerns, as research shows they will experience a positive increase in reputation, efficiency, effectiveness, competitive advantage, and revenue (Ferro et al., 2017; Vijayvargy, Thakkar, & Agarwal, 2017). Conversely, by ignoring these concerns, organisations will face serious implications in terms of reputation, brand equity, governmental pressure, and long-term sustainable endurance in the industry (Vijayvargy et al., 2017; Zhu, Chen, Yu, & Fan, 2018).

These strong incentives do motivate organisations to adopt green initiatives, however the reality is that organisation's often choose the inexpensive solutions to satisfy the minimum environmental objectives (Tate, Ellram, & Kirchoff, 2010). This green behaviour by organisations should be addressed because environmental concerns is

constantly accelerating and requires a collaborative effort in the supply chain to mitigate the environmental damage caused (Hong & Guo, 2019). Encouraging organisations to adopt environmental collaboration within their supply chain network is vital at a global scale because most international organisations operate through franchising, joint ventures and have international procurement and logistic corporations (Bofinger, 2016; Lee, Tae Kim, & Choi, 2012). Hence targeting environmental objectives collectively will result in an abundance of resources, capabilities and knowledge to solve evolving and challenging environmental issues (Yen, 2018).

Theoretical research has established unanimously that environmental collaboration is a mediator or moderator in attaining green supply chain management and circular economy (Arora & Arora, 2020). However the internal organisational resources and capabilities that initiate the organisation's commitment to environmental collaboration needs to be explored (Trujillo-Gallego, Sarache, & Sellitto, 2021). Furthermore, the point at which operational collaboration extends to environmental collaboration is explored in this research. The methodological contribution of this research is exploring environmental collaboration from qualitative lens in a supply network rather than the dyad and triad relational stance taken in the literature (Gölgeci, Gligor, Tatoglu, & Arda, 2019). The relational network exploration of environmental collaboration allows for the phenomenon to be theoretically explored in a context in which it occurs in the supply chain rather than bound by focal organisation's resources and capabilities. By exploring environmental collaboration through a qualitative research method, the scope, and the integrated components of collaborative effort in a supply network are better understood. The integral synchronisation of an extended environmental collaboration with existing operational collaboration sheds further light in the operational and relational components of attaining environmental objectives in a network-based setting (Ahmed et al., 2020; Govindan et al., 2019). The following reveals the research aim and research questions pursued in this study:

***Research Objective 1:*** *To understand the factors of green organisational orientation.*

***Research Question 1:*** *"What are the factors that create a green organisational orientation?"*

***Research Objective 2:*** *To understand the influence of green organisational orientation as precursors of environmental collaboration.*

***Research Question 2****: "How does green orientated organisations environmentally collaborate in the supply network?"*

***Research Objective 3:*** *To understand the relational factors that facilitate the quality of environmental collaboration between green organisational orientation and the supply network.*

***Research Question 3****: "What are the relational factors assisting green organisational orientation and environmental collaboration to transpire between channel partners?"*

## 1.4 Significance of the Study

The significance of this study is that it develops a substantive theoretical model of environmental collaboration in the context of the furniture industry. The theoretical helps identify the evolving path of environmental collaboration from the perspective of an organisation with a supply network that leads to industrial environmental collaboration. The theoretical lens adopted in this research as Natural Resource Based View and Interorganisational Relational View (Dyer & Harbir, 1998; Hart, 1995). Natural Resource Based View underpinned the internal resources and capabilities needed within an organisation for environmental collaboration (Hart, 1995). Interorganisational Relational View underpinned the external relational rents needed to strengthen the collaborative process between the stakeholders (Dyer & Harbir, 1998).

This study addressed four significant gaps in the literature. Firstly, the point at which operational collaboration extends to environmental collaboration is explored. Secondly, the precursors that initiate environmental collaboration in the supply chain is explored. Thirdly, by responding to the call of the literature in terms of exploring environmental collaboration through qualitative research methods (Gölgeci et al., 2019). The grounded theory research methodology led to the emergence of the precursors and components of environmental collaboration in a network perspective by interviewing the collaborative partners in a supply network. This provides an opportunity to explore environmental collaboration from a network relational perspective in which it resides

in. This brings a more realistic perspective to supply network relationships beyond the dyad and triad partnerships that saturate the supply chain literature (Miemczyk, Wilding, Johnsen, & Macquet, 2012). Finally, by exploring the network relationships, the relational factors that strengthen environmental collaboration in a supply network emerged.

Green organisational orientation emerged as the antecedent of environmental collaboration. Green organisational orientation helps drive the organisation's efforts in attaining green issues. Although green conscious leadership and forming a green organisation are internal measures, they help in the adoption and facilitation of the changes required to environmentally collaborate with supply networks. Moreover, the commitment of the organisation is defined by the roles and efforts of the green conscious leadership and in the formation of a green organisation. When assessing plausible green practices, the point of integrating the operational collaboration to environmental collaboration in the supply network begins. During this stage, the organisation assesses whether attaining green issues as a competitive advantage or sharing these resources and capabilities to attain more green issues with partners in the supply network.

During supply network collaborations the restructuring of the supply network aids in facilitating environmental collaboration. By reorganising the spatial distance and depth of the supply network, a more lean and efficient environmental collaboration can be achieved. By consciously reflecting on the alliances available in the tiers of the supply chain, an organisation can identify the alliances that are committed to green issues and those that have no intention of changing. Next, the coordination of environmental organisation can be accomplished amongst identified alliances. The 7-step process involves identifying existing resources and capabilities, the integration of information and knowledge, the formalising of environmental objectives, unifying green standards, developing an environmental code of conduct, constant environmental reporting, and the monitoring of environmental practices. These coordination steps help organise and govern the environmental collaboration amongst the supply networks. Finally, defining partners' roles helps identify the contribution that each member of the supply network can make to the environmental collaboration. For example, suppliers have emerged as

significant contributors to research and development by providing information on green raw materials. Manufacturers, due to their spatial position in the network with upstream and downstream partners, have emerged as hubs for collaboration. Logistics have provided green transportation and reverse logistics capabilities but were also found to be critical resources in connecting the supply network with more like-minded alliances globally. Retailer's roles in engaging green conscious customers to participate in environmental collaboration is detrimental in increasing demand of green products. Retailers were also responsible for providing information on green demands, which cultivates the commitment of the supply network for environmental collaboration to increase green production.

One of the findings of this study is that the uncertainties, risks, and costs of environmental collaboration can be mitigated with increased economies of scale in green production. To attain this, industrial environmental collaboration needs to be acquired by the supply network. Competitors and associations play a critical role in attaining industrial environmental collaboration. Competitor environmental coopetition is needed to elevate the standards of green production throughout the industry. Finally, associations have two critical roles in facilitating environmental collaboration, by uniting the industry and by liaising with government. Uniting the industry will help to elevate the supply network's collaborative efforts towards a coordinated industrial effort. Liaising with a government helps aggregate the environmental issues evident in the industry that need the co-development of policies to resolve.

Relational factors strengthen environmental collaboration between organisations and the supply network (Wong et al., 2021). The relational factors establish green supply alignment, dynamic power asymmetries in the supply network, trust in green supply alignments, communication in a green supply network, transparency in sharing green resources and capabilities, and authenticity in green supply alignments. In establishing green supply alignments, the alliances choose partnerships for collaborations and then synchronise their partnership efforts. In dynamic power asymmetries in the supply network, the shifting and synchronisation of power asymmetries are pursued amongst alliances. In trust in green supply alignments, the trust in partners commitment to environmental collaborate and trust in relational recovery is significant. Communicating

in a green supply network requires forming communication channels and communicating green knowledge. Transparency in sharing green resources and capabilities involves transparency in information sharing and relational recovery. Finally, authenticity in green supply alignments involves establishing authentic intent to collaborate, and authenticity when claiming to be green. Finally, authenticity in green supply alignments involves establishing authentic intent to collaborate and authenticity in green claims. In conclusion, as highlighted in the conceptual framework, environmental collaboration is not a linear path. In fact, it requires constant moderation and adjustment in all three phases for the continuing development of environmental collaborations.

## 1.5 Design of the Study

This study applied a qualitative research methodology in exploring environmental collaboration (Scharp & Sanders, 2018). The philosophical assumption underpinning the study is a pragmatic approach that facilitates identifying the participants lived reality in the pursuit of solving a problem (Bryant, 2009). Grounded theory helps to form a substantive theory, based on the grounded themes that emerged from the data (Charmaz, 2001). By using a grounded theory approach the iterative and comparative techniques underpinned the supporting themes that emerged from the data (Bryant & Charmaz, 2007). Purposive and expert sampling was used to identify organisations that have adopted green practices as players in the furniture industry (Gentles, Charles, Ploeg, & McKibbon, 2015). Data collection involved contacting top managers in the organisations that are responsible for making sustainability decisions and who collaborate with the supply network partners. Hence, based on the scale and structure of the organisation, some participants were CEO's, some were sustainability managers, while others were supply chain supervisors. The snowballing sampling technique was also used to track the participant's collaborating partners (Gentles et al., 2015). Theoretical saturation was achieved at a sample size of 21 participants. These participants included retailers (n=6), manufacturers (4), suppliers (4), logistics (4) and associations (3).

The coding process began after each transcribed interview was approved by the participants using NVivo software to code the data (Houghton et al., 2017). Inductive

techniques were used to identify the open codes and the selective and axial codes (Braun, Clarke, Hayfield, & Terry, 2019; Corbin & Strauss, 2008). The themes that emerged were categorised as antecedent, component, or relational factors of environmental collaboration. Cross comparison and thematic analysis helped develop the high order themes under each category (Charmaz, 2001). Both techniques allowed the codes to be further interpreted in terms of their contradictions, expansion and supports to the categories (Braun & Clarke, 2019). An integral part of the data analysis stage was using the triangulation method to apply rigour to the data (Creswell & Poth, 2018). Firstly, the participants responses were cross referenced against the information and reports available on an organisation's sources. Secondly, the conceptual framework was sent back to the participants to further identify their interpretation of the final work. The participant's feedback was further deliberated and adjusted in the work.

## 1.6 Researcher's Position

The motivation of this study was derived from the researcher's personal attempts to be an environmentally conscious consumer. Unfortunately, due to economic constraints and the lack of variety in green products, the journey to becoming a complete green consumer became too challenging. As a marketing research student, the motivation to further explore the reasons why there are not enough green products sparked the initial inspiration for this thesis. This study was undertaken between July of 2018 and December 2021. The theoretical synthesis of the research was approved by the Postgraduate Research Board of the Auckland University of Technology in August of 2019. In this time the literature review of environmental collaboration, green supply chain management and circular economy was undertaken to form the research problem and questions. Once confirmation of candidature was attained, the literature review wasn't reviewed to allow the researcher to take an inductive and unbiased approach during data collection. After the ethical approval for data collection was received, the first participant was interviewed in October 2019. Unfortunately, the Covid-19 pandemic influenced the participants positive responses to participating in this research. During this time most potential participants were assessing the uncertainty and risks influencing their supply chain resilience, which prolonged the data collection period to April of 2021, when theoretical saturation was achieved. However, the positive influence

was that those participants who did participate in the study were continuing to collaborate environmentally, despite the economic uncertainty and the risks that challenged their efforts. This provided a genuine sample size of participants who were committed to environmental collaboration and who believed in their efforts to target environmental objectives. The participants were collaborative partners in the furniture industry in New Zealand and Australia. They had no personal or professional relationship with any of the research team. They were recruited using cold canvassing and snowballing techniques based on the environmental reports provided on their websites. The researcher has no prior practical experience in supply chains, hence the themes that emerged are purely inductive and representative of the participant's responses. Once the theoretical model was confirmed with participants the literature review on each component was conducted.

## 1.7 Outline of the Thesis

This thesis consists of seven chapters. In Chapter 1, an introductory overview of the purpose of the study is discussed. The scope of the study identifies the significant environmental impact the furniture industry has and the importance of attaining environmental objectives as a collaborative effort in a supply network. In Chapter 2, the literature review synthesises the theoretical understanding of environmental collaboration. It identifies the research gap when pursuing environmental collaboration from a qualitative research method. The theoretical underpinning of the study helps identify the resources and capabilities of environmental collaboration and the relational partnerships that help the supply network attain competitive advantage. In Chapter 3, the philosophical lens of the research is discussed, with an in-depth explanation of the research method applied. The data collection procedure and the participant's qualities are discussed to justify the sampling criteria of the study. To demonstrate the rigour of the study, a detailed discussion on the application of grounded theory, thematic analysis and cross comparison approaches are discussed. A demonstration of the researcher's memoing, coding, and selective and axial coding techniques is provided.

In Chapter 4, the supporting themes of the precursors of environmental collaboration is discussed. These include green conscious leadership, forming a green organisation and assessing plausible green practices. In Chapter 5, the supporting themes of components

of environmental collaboration are discussed. These include restructuring the supply network, the coordination of environmental collaboration, and defining partner roles in supply chain environmental collaboration. Industrial environmental collaboration and the themes of competitor competition and the association's role are discussed in Chapter 5. In Chapter 6, the themes supporting the relational factors that strengthen supply chain environmental collaboration are discussed. These include establishing green supply alignments, dynamic power asymmetries in the supply network, trust and communication in green supply alignments, transparency in sharing green resources and capabilities and authenticity in green supply alignments. Finally, in Chapter 7, the conceptual framework is discussed with an in-depth discussion about the theoretical and managerial contribution of the study. The chapter concludes this thesis by identifying the limitations and possibilities of future research.

## 1.8 Definitions of Key Terms in the Thesis

Some definitions exist in this thesis that need to be well outlined and scoped. Supply chain is defined as a set of three or more entities directly involved in the upstream and downstream flow of products, services, and/or finances from a source to a customer (Lambert, Cooper, & Pagh, 1998; Stevens, 1989). The chain of command of procurement, manufacturing, and delivery of products between organisations is considered a supply chain (Chandra & Kumar, 2000; Stevens, 1989). The parts of the supply chain that are distinctively valuable and unique in providing a desired outcome is known as the value chain (Porters, 1985). A value chain is defined as a business system that creates customer satisfaction and realises the stakeholder's objective (Porters, 1985). Throughout the supply chain there are some stakeholders who exert a defined value proposition on the outcome of products and services (Tian et al., 2021).

The supply chain is a synchronisation of operational and relational efficiency that results in ultimate performance outcomes (Wong et al., 2021). Supply chain integration is the degree to which a manufacturer strategically collaborates with its supply chain partners to collaboratively manage intra and inter-organisational processes in order to achieve effective and efficient flows of products and services, information, money, and decisions, thus providing maximum value to the customer (Simatupang, Wright, & Sridharan, 2002). The quality of collaboration between supply networks is largely

influenced by the degree to which the partners are integrated (Zhang, Pan, Jiang, & Feng, 2020). Backward integration is defined as the synchronisation of efforts and collaboration with organisations further down the supply chain, such as suppliers and manufacturers (Ji, Yuan, Feng, & Wang, 2020). Forward integration is defined as the synchronisation of efforts and collaboration with organisations up the supply chain, such as logistics, retailers, distributors, and customers (Ghozali Hassan, Abindin, & Nordin, 2018). The essence of integration is that the supply chain networks collaborate. Supply chain collaboration is defined as the joint relationship and coordination of efforts within the supply chain to achieve efficient and effective performance outcomes (Boddy, Macbeth, & Wagner, 2000).

Introducing environmental concerns into the supply chain can result in a green or sustainable supply chain management, or in a circular economy (Sarkis, 1999). A green supply chain refers to integrating environmental concerns and considerations into the supply chain (Sarkis, 1999). The components of a green supply chain are green procurement, green manufacturing, green logistics and recycling practices (Sharma et al., 2020). It takes a life cycle assessment approach in implementing green attributes to the "cradle to the grave" of the products and services that are produced and consumed (Abdallah, Farhat, Diabat, & Kennedy, 2012). A sustainable supply chain refers to integrating environmental, social, and economic considerations into the supply chain (Ansett, 2007). The circular economy is a development model that integrates reduction, reuse, and recycling into the supply chain (Lieder & Rashid, 2016). A critical component of a circular economy is integrating reverse logistics, which means the collection of used products for remanufacturing (Julianelli, Caiado, Scavarda, & Cruz, 2020). The ideal objective of a circular economy is to recycle all the production outcomes from the supply chain for remanufacturing, in order to eliminate as much waste as possible (Mahadevan, 2019).

Aspiring for either green, sustainable supply chains or a circular economy requires the supply network to collaborate environmentally (Liu et al., 2018). Environmental collaboration refers to the joint planning and coordination of supply chain partners to attain environmental objectives (Vachon & Klassen, 2008). The driving commitment of organisations to pursue green issues with supply networks is a green organisational

orientation. Green organisational orientation is defined as the activities the firm adopts in addressing environmental issues. Green organisational orientation has proven to be driven internally by the organisation, within the bounds of their resources and capabilities that can be compatible in solving the green issue (Al-Sheyadi, Muyldermans, & Kauppi, 2019). The operation and relational synchronisation of the supply networks collaboration is strengthened by the existing relational factors embedded between the partnerships (Wong et al., 2021). Relational factors are defined as the relationship characteristics that create quality collaboration between partners in a supply network (Michalski, Montes, & Narasimhan, 2019). The relational attributes that exist between network partners influences the quality and stability of collaboration (Ahmed et al., 2020).

## 1.9 Conclusion of Chapter 1

This thesis aims to respond to the call of the supply chain literature to explore environmental collaboration through a qualitative methodology. Qualitative methodology helps identify the precursors and components of environmental collaboration (Bryant & Charmaz, 2007). By interviewing all the collaborative partners in the supply chain, the relational factors that strengthen environmental collaboration in a supply network can be further identified (Braun et al., 2019). In the proceeding chapter, a critical literature review is conducted to synthesise the current academic knowledge on environmental collaboration and to identify the theoretical research gaps that are addressed in this study.

# Chapter 2 Literature Review

## 2.1 Introduction

The purpose of this research is to explore environmental collaboration from the perspective of multiple actors in the supply chain network. Firstly, this research responds to the call of the literature to understand the points at which operational collaboration extends to environmental collaboration (Hazen et al., 2020). Secondly, the precursors of environmental collaboration are explored (Jahanshahi & Brem, 2018). Thirdly, environmental collaboration is explored from a relational network perspective in which it occurs in the supply chain (Mardani et al., 2020). Finally, the network relational factors that bind and strengthen the collaborative behaviour in the supply chain are also explored (Touboulic & Walker, 2015). In this chapter, the sections will explore the literature review on environmental collaboration, precursors and the relational factors of environmental collaboration, theoretical underpinnings, the research gap, plus research questions and the conclusion.

## 2.2 Identification of Literature Review

The objective of this research is to explore the phenomenon of environmental collaboration. However, since the methodological lens of this research is grounded theory, the literature review was done in two stages. Firstly, some literature was reviewed to understand the research problem and question at a macro perspective. Secondly once the theory was built the researcher revisited the literature review to critique existing knowledge based on the inductive themes emerged. The literature review presented in the proceeding sections is the result of stage two interpretations post theoretical development. Hence the subheadings of each subject correspond with the logic and sequential order of the themes emerged. The research strategy adopted in this research is demonstrated in the following Table 2.1.

| Keywords | Databases | Source type and Number of Article results | Inclusion Criteria |
|---|---|---|---|
| "Sustainable collaboration" **OR** "environmental collaboration" **AND** "Supply chain" **OR** "supply network" | Business Source complete | Academic Journals n=< 4000 | Supply chain management, supply chain, English n=372 |
| | Scopus | Academic Journals n=65 | |

Table 2:1: Search strategy of literature identification of environmental collaboration

From the identified literature, 372 articles were read. At this stage the relevancy of the articles to the contribution of environmental collaboration in a supply chain was assessed. This resulted in the synthesis of 36 articles exploring environmental collaboration (Appendix A), 17 articles exploring precursors of environmental collaboration (Appendix B) and 18 articles exploring relational factors of environmental collaboration (Appendix C). The following Table 2.2 highlights the summary of the key articles from each category.

As demonstrated in Table 2 below, environmental collaboration consists of operational and relational components (Bouguerra et al., 2021). The relational components strengthen the operational environmental collaboration amongst supply chain networks (Ahmed et al., 2020). Hence there is empirical evidence that an organisation's commitment and top management influences environmental collaboration (Lee & Joo, 2020). Moreover, environmental collaboration is mostly explored from a perspective of a focal organisation, often a manufacturer or a supplier collaborating with upstream or downstream partners in a dyad or triad relationship (Govindan et al., 2019). The findings, therefore, are bound by the unique capabilities and resources of a focal organisation, rather than by a collaborative effort of the myriad of actors evident in the supply network (Govindan, Shaw, & Majumdar, 2021).

Therefore, this research aims to qualitatively explore environmental collaboration to inductively understand the resources and capabilities that exist in an organisation, which drives collaborative behaviour in the supply network. The intersect of the synchronised operational and relational components of environmental collaboration are then explored. By taking a network perspective, the unique resources and capabilities that exists in each organisation type as an antecedent of environmental collaboration is explored. Finally, the relational qualities that strengthen environmental collaboration in a network of relationships beyond dyad and triad partnerships is explored.

| No. | Arthurs- Tittle | Type of Study | Independent Variable | Dependent Variable | Key Findings |
|---|---|---|---|---|---|
| **1.** | Vachon and Klassen (2008)- Environmental management and manufacturing performance: The role of collaboration in the supply chain | Qualitative and empirical- environmental collaboration amongst manufacturers of package printing industry in North America (Canada and United States). 6 plant visits, 6 semi structured interviews with plant managers. 84 surveys to 366 plants with 90 employees. | Prior performance, plant size, parent company size, age of presses, reinvestment rate, supply base and customer concentration | Environmental collaboration with suppliers and customers. | Environmental collaboration is defined as the joint environmental planning activities and cooperation in finding solutions to environmental challenges. Environmental collaboration has a significant positive impact on manufacturing and environmental performance. External stakeholders such as customers and distributors are critical in the implementation of ISO-certified environmental management system and the organisation's compactivities. |
| **3.** | Green et al. (2012)- Do environmental collaboration and monitoring enhance organisational performance? | Empirical-Quantitative Survey. 159 manufacturing managers. | Internal environmental management, green information systems, environmental cooperation with suppliers, environmental cooperation with customers, environmental monitoring of suppliers, environmental monitoring of customers. | Environmental performance, organisational performance. | Environmental collaboration and monitoring practices with suppliers and customers positively influence environmental and organisational performance. |
| **4.** | Gölgeci et al. (2019)- A relational view of environmental performance: What role does environmental collaboration and cross functional alignment play? | Empirical- 270 Turkish companies | Relational capability, social capital, environmental collaboration, (mediator), cross-functional alignment (moderator). | Environmental performance. | Environmental collaboration mediates the influence of relational capability and social capital on environmental performance. Cross functional alignment of marketing and supply chain management functions strengthens the influence of relational capability on environmental collaboration towards environmental performance. Further research is needed to explore the influence of cross functional alignment and environmental collaboration in terms of environmental performance outcome. |
| **5.** | Mehdikhani and Valmohammadi (2019)- Strategic collaboration and sustainable supply chain management: The mediating role of internal and external knowledge sharing | Empirical- survey of 271 manufacturers in Iran. | Strategic collaboration, external knowledge sharing (mediator), internal knowledge sharing (mediator). | Sustainable supply chain management- social, economic, environmental. | External and internal knowledge sharing positively mediates the relationship between supply chain collaboration towards sustainable supply chain management. However, supply chain collaboration is also positive significant with external and internal knowledge sharing. This indicates that knowledge sharing is an integrated part of supply chain collaboration. |

| | | | | | |
|---|---|---|---|---|---|
| **6.** | Ahmed et al. (2020)- Analysing the impact of environmental collaboration among supply chain stakeholders on a firm's sustainable performance. | Empirical - Survey of 126 manufacturers in Pakistan implementing green supply chain Management. | Institutional pressures, customer monitoring, internal green supply chain management, supplier monitoring, customer collaboration, supplier collaboration. | Environmental performance, financial performance, operational performance. | Customer monitoring and institutional pressures positively influences the organisations adoption of internal green supply chain practices. This positive influence triggers organisations to collaborate with customers and monitor suppliers. ultimately achieving environmental and operational performance is positive through the influence of internal green supply chain management. However financial performance is not achieved as the costs incurred for green practices is higher. |
| **7.** | Lee and Joo (2020)- The impact of top management's support on the collaboration of green supply chain participants and environmental performance. | Empirical - Survey of 301 companies that are establishing a green supply chain. | Top management support, collaboration with suppliers (moderators), collaboration with customers (moderators). | Environmental performance. | Top management support positively influences environmental performance. This relationship is positively moderated through collaboration with suppliers and customers. This research validates the important role of top management support for achieving environmental performance through collaboration. |
| **8.** | Trujillo-Gallego et al. (2021)- Identification of practices that facilitate manufacturing companies' environmental collaboration and their influence on sustainable production. | Empirical l- A survey of 43 Colombian manufacturing companies. | Internal environmental management, eco-design, green human resources, green information systems and technology, green marketing, reverse logistics, environmental collaboration, control variables (company size, export orientation). | Green purchasing, green manufacturing, green distribution. | Internal environmental management, eco-design and green marketing have a positive effect on environmental collaboration. However, green human resources, green information and systems technology and reverse logistics had no influence on environmental collaboration. Environmental collaboration does positively influence green purchasing, green manufacturing, and green distribution. |

Table 2:2: Summary Table of Key Articles in the Environmental Collaboration Literature

## 2.3 Environmental Collaboration

Environmental collaboration is the joint planning of environmental objectives with supply chain partners (Vachon & Klassen, 2008). Environmental collaboration has been empirically studied through mathematic modelling and quantitative methods as a mediator or moderator in attaining a green or sustainable supply chain (Asif et al., 2020) and a circular economy (Dora, 2019). The findings demonstrate the significant positive influence of collaboration in the supply chain for attaining green, sustainable or a circular economy performance measurements (Dora, 2019; Luo, Chong, Ngai, & Liu, 2014). Hence, the academic literature on the supply chain has called for further exploration of environmental collaboration, both qualitatively and empirically (Asif et al., 2020; Ho, Kumar, & Shiwakoti, 2019). The academic knowledge has provided theoretical knowledge on the pressures (Ramanathan, Bentley, & Pang, 2014), incentives (Pakdeechoho & Sukhotu, 2018), process (Wong et al., 2021), components (Laari, Solakivi, Töyli, & Ojala, 2016), stages (Attaran & Attaran, 2007), types (León-Bravo, Caniato, Caridi, & Johnsen, 2017), strategies (Soosay, Hyland, & Ferrer, 2008) and governance (Morcillo-Bellido & Duran-Heras, 2020). The chronological order of the literature of environmental collaboration is depicted in Appendix A.

One of the earliest explorations of environmental collaboration is the understanding of the pressures and parameters in which organisations are drawn to attaining environmental objectives within their supply network (Albino, Dangelico, & Pontrandolfo, 2012). Research has identified a myriad of pressures that influence the organisation's commitment to environmental collaboration, including governments (Ramanathan et al., 2014), regulations (Fadeeva, 2005), supply partners (Reficco, Gutiérrez, Jaén, & Auletta, 2018), customers (Flint & Signori, 2014), competitors (Ho & Lu, 2015), and social drivers (Hofman, Blome, Schleper, & Subramanian, 2020).

There is an overall concurrence as to the positive influence of such pressures to drive organisations towards environmental collaboration (Grekova, Calantone, Bremmers, Trienekens, & Omta, 2016). Although such pressures positively influence the organisation's commitment to pursue environmental collaboration, it doesn't influence the adoption of innovation needed to address evolving environmental issues during collaboration (Grekova et al., 2016). This is because the implementation of

environmental collaboration is very uncertain, risky, costly and challenging (Irani, Kamal, Sharif, & Love, 2017). For organisation's to commit to environmental collaboration, considering the costs and challenges, support and incentives are more important than pressures from governments and regulations (Ding, 2014). However, across governments, the incentives and support for organisations to pursue environmental collaboration are limited (Gunasekaran, Subramanian, & Rahman, 2015). Moreover, environmental collaboration is distinctly different to operational collaboration in terms of implementation and processes (Adams, Richey, Autry, Morgan, & Gabler, 2014).

The ethos of environmental collaboration requires regulations that support cleaner production and reduced carbon emission practices (Bao & Zhang, 2018). However the regulations in support of operational collaboration are often conflicting and negatively influence environmental standards (Arimura, Darnall, & Katayama, 2011). This is because regulations in operational collaboration mainly focus on attaining economic performance through integration and cost effective practices (Fiorino & Bhan, 2016). In supply chains, the cost-effective approaches often result in forgoing green practices such as recycling or product stewardship programs (Wan Ahmad, Rezaei, Tavasszy, & de Brito, 2016). Thus, although governments and regulations do pressure organisations to commit to environmental collaboration, a deregulation of policies that are inclusive of all stakeholder's concerns is required (Fadeeva, 2005; van Riel, Liljander, Semeijn, & Polsa, 2011).

It is evident that large scale multinational organisations are more prone to probe their suppliers to implement green practices in the supply network (Reficco et al., 2018). However, in terms of volume, such pressure is not high enough to cultivate an economy of scale in green production and supply (Lin, Tan, & Geng, 2013). Moreover, the large scale organisations often take an opportunistic approach during environmental collaboration to exert green standards on to their partners, rather than integrating their partners concerns in the collaboration process (Cheng & Sheu, 2012). Therefore the exertion of power and opportunistic behaviour develops a friction during environmental collaboration that is void of stakeholders concerns and objectives (Wong et al., 2021).

Customer pressure is evident through their demands for green products and this has been increasing rapidly over the past decade (Zhu, Feng, & Choi, 2017). Similar to

supplier pressure, customer's demand of green products is reduced demand which doesn't result in an economy of scale of green production in the supply network (Ghosh & Shah, 2015). Therefore the green products available to customers are still costly to make and require a higher price point that isn't affordable for the majority of customers, despite their intention to be green (Chekima, Syed Khalid Wafa, Igau, Chekima, & Sondoh, 2016). In some product categories however, the elevated price for sustainable products induces social status behaviour from customers (Jan, 2018). The literature identifies green marketing as an antecedent that drives the demand for green products (Khan, Khalid, Zaman, Jose, & Ferreira, 2021).

However, from the supply chain perspective, adopting green marketing to attract more green conscious customers has its challenges (Tan et al., 2021). Research shows that consumers have growing scepticism about the credibility and validity of green claims made by organisations practicing green marketing (Tan et al., 2021). This is because of the lack of moderation of green washing claims evident in various industries (Chen, Bernard, & Rahman, 2019). From a supply chain perspective, environmental collaboration requires greater commitment and endurance, since relying on green marketing to increase customer demand brings about more scepticism and further negative perceptions (Zhang, Li, Cao, & Huang, 2018).

Environmental collaboration is a process that is based on industry regulations, country influences, the environmental issue targeted, the relationships and motives within the network, and the design of the supply chain (Min et al., 2005; van Hoof & Thiell, 2014). Therefore, environmental collaboration in any supply chain is unique to the properties of the industry, its operational activities and the types of partnerships evident in the supply network (Min et al., 2005). A good quality collaboration sits at the centre of the of the interaction of stakeholder assets, roles and capabilities (Dania, Xing, & Amer, 2019). The drivers of collaboration include joint efforts, collaborative values, sharing activities, adaptation, trust, power, stability, commitment, continuous improvement and coordination (Paula, Campos, Pagani, Guarnieri, & Kaviani, 2019). This is an integrated system in which the supply network collaborates on environmental, economic and social requirements (Dania et al., 2019). Therefore there is a need to explore the operational and relational components of environmental collaboration as

an integrated system as it occurs in a supply network (Dania et al., 2019; Trujillo-Gallego et al., 2021).

Environmental collaboration includes the strategic intent, internal alignment, relationship orientation, relationship investment, information and communication flow, and the formalisation of processes (Laari et al., 2016; Min et al., 2005). Collaboration components include information sharing, joint planning, joint problem solving, joint performance measurement and the leveraging of resources and skills (Ansett, 2007; Li, 2018; Min et al., 2005). Within each component exists the operational activity and relational activity of sharing (Vachon & Klassen, 2008). Environmental collaboration within a pollution prevention strategic intent requires less commitment and sharing of information compared to a sustainable development strategic intent (Ren et al., 2019). Hence the relational alignments also influence the outcome of collaboration including efficiency, effectiveness, profitability and the reinforcement or expansion of relationships (Ansett, 2007; Min et al., 2005).

The uniqueness of environmental collaboration is based on the country, industry and supply network (Blome, Helen Walker, Paulraj, & Schuetz, 2014). From an organisation's perspective there exists different types of collaborative relationships evident in the supply chain that can be characteristic, transactional, event or process based (León-Bravo et al., 2017). Characteristic collaboration refers to organisational level involvement from a selected number of people when sharing knowledge (Dubey et al., 2018; León-Bravo et al., 2017). Transactional collaboration refers to operational and short term collaborations that are in response to rectifying existing errors (León-Bravo et al., 2017). Event collaboration refers to tactical and medium term collaborations that involve joint planning and decision making that result in market oriented performance outcomes (León-Bravo et al., 2017). Finally, a process collaboration is a long term and strategic integrated process that is aimed at future sustainable development (León-Bravo et al., 2017). The types of collaboration further reinforce the importance of relational actors in sustaining the endurance of the operational activities, challenges, risks and costs inevitable during environmental collaboration (Touboulic & Walker, 2015).

Another integrated system perspective on environmental collaboration concerns the stage at which it occurs (Theiben, Spinler, & Whu, 2014). The planning stage requires an information and communication flow between partners to define the objectives that need to be addressed (Attaran & Attaran, 2007). The forecasting of demand and supply stage identifies the operational discrepancies and capabilities that bridge the strategic intent of all the partners (Attaran & Attaran, 2007). The execution stage is the where the performance outcomes are reiterated between partners, and the final analysis stage is the constant learning from and development of the process to resolve issues so they don't recur(Attaran & Attaran, 2007). The evolution and momentum of collaboration between the stages is reliant on the commitment and alignment of the supply network (Petersen, Brockhaus, Fawcett, & Knemeyer, 2017).

To demonstrate the significance of collaboration in the supply chain, research shows reverse logistics is an instrumental operational implementation that could revolutionise recycling processes at the end of a product's life (Campos et al., 2020; Yang, Chung, Wee, Zahara, & Peng, 2013). These recycling products need to be collected from customers and waste management sites and returned to manufacturers for reassembling (Shu-qin & Wei, 2008). Although the capability of reusing these products lies with manufacturers, the resource and information about demand lies with retailers (Li, 2018; Shu-qin & Wei, 2008). By creating a shared collaborative network between manufacturers, retailers, end users and waste management companies, reverse logistics is possible (Shu-qin & Wei, 2008; Yang et al., 2013). Hence it is evident that environmental collaboration is the synchronisation of information sharing among alignments so they can make decisions that are innovative, that address green issues and that don't economically jeopardise the existing operational capabilities of the supply network (Simatupang & Sridharan, 2008).

The evolving and situational properties of environmental collaboration leads to challenges in governance mechanisms (Ru-Jen Lin & Chwen Sheu, 2011). It can be noted that contractual mechanisms and relational adaptations help mediate the effect of risk uncertainty and environmental performance (Miranda-Ackerman, Azzaro-Pantel, Aguilar-Lasserre, Bueno-Solano, & Arredondo-Soto, 2019; Ru-Jen Lin & Chwen Sheu, 2011). Others note that collaboration is a balance of governance and the sustaining of

relationships in the network (Bhattacharjee & Mohanty, 2012; Cosimo Rota, Nikolai Reynolds, & Cesare Zanasi, 2013). Governance is comprised of selecting information and data to share via technologies to a selected number of partners with a defined width and depth of activities, strategies, both tactical and operational (Bhattacharjee & Mohanty, 2012).

Another catalyst that is embedded in the relationships in environmental collaboration is the management and sharing of information and knowledge (Dubey et al., 2018; Pero, Moretto, Bottani, & Bigliardi, 2017). It is noted that it is the level of information and knowledge shared between partners that positions them in the equilibrium of partially or fully sustainable collaborative organisation (Pero et al., 2017). The significance of knowledge management needed in a collaborative process is a strategic loop that is embedded in strategic, managerial, organisational, technological, environmental, financial, human-socio and operational levels throughout the chain (Aboelmaged, 2018; Irani et al., 2017). The knowledge to be shared in each factor is either a catalyst for becoming greener or an incentive for green initiatives (Aboelmaged, 2018; Irani et al., 2017). Part of the capability of an organisation to manage and share knowledge is its capability to learn (Bae & Grant, 2018; Merkel & Seidel, 2018). By establishing integrative mechanisms and systems for learning, organisations can encourage the learning and knowledge required for environmental collaboration in the supply chain (Bae & Grant, 2018; Dubey et al., 2018).

Some of the transparent information needed to be disclosed to partners in an environmental collaboration includes pollution controls, waste material treatment capability, green image, pollution prevention, environmental competencies, recycling, environmental cost, occupational health and safety management systems, work health and safety, the interests and rights of employees, an environmental management system, and return handling capabilities (Irani et al., 2017). Partners need to disclose the issues that must be addressed during the collaboration (Lee & Ha, 2021). Using environmental management systems, these are then clearly communicated throughout the supply network (Wu & Lin, 2013). This further validates the importance of the operational activity of knowledge sharing, which has the relational compatibility of transparent communication (Gloet & Samson, 2019; Jazairy, von Haartman, & Björklund,

2021b; Mehdikhani & Valmohammadi, 2019). Many researchers highlight the fact that knowledge sharing capability is an instrumental part of creating an adaptive and flexible integrated supply network for environmental collaboration (Mehdikhani & Valmohammadi, 2019; Ren et al., 2019).

Qualitative research shows that environmental collaboration is often referred to as a "journey" that is often taken to mean a synchronisation of internal and external relational commitment to environmental objectives (Flint & Signori, 2014). This has been further empirically tested by demonstrating the mediating role of guanxi in the relationship of the buyer-seller relationship and in green collaboration (Luo et al., 2014). The role of guanxi demonstrates that environmental collaboration surpasses the bonds of relational qualities and requires a more in-depth commitment and relational investment (Luo et al., 2014). Therefore as much as the operational capabilities are needed for environmental collaboration to operate, the relational actors that respond in the supply network strengthen the process through their commitment to the environmental objectives (Touboulic & Walker, 2015).

## 2.4 Green Organisational Orientation as an Antecedent of Environmental Collaboration

As mentioned previously, environmental collaboration occurs due to the commitment and strategic intent of organisations to collaborate for environmental objectives using the supply network (Green et al., 2012). Therefore there is evidence that the internal capabilities of a firm also influence its drive for environmental collaboration (Green et al., 2012). The supply chain literature identifies these internal drives as internal environmental collaboration that focuses on the intra-organisational coordination, while external environmental collaboration refers to inter-organisational coordination (Niesten, Jolink, Lopes de Sousa Jabbour, Chappin, & Lozano, 2017; Solakivi, Laari, Töyli, & Ojala, 2017). Internal environmental collaboration includes having a green policy, green transport and green marketing, while external collaboration includes coordinating efforts with suppliers and customers (Niesten et al., 2017; Solakivi et al., 2017). There is empirical and theoretical evidence that the capabilities embedded in internal collaboration drives external collaboration and therefore impacts the overall greening of the supply chain (De Silva, Howells, & Meyer, 2018; Stank, Keller, & Daugherty, 2001).

Appendix B illustrates the chronological order of the precursors of environmental collaboration.

Considering the importance of internal capabilities, research notes that organisation's that have increased their practice of internal collaboration are more productive and more committed to environmental collaboration (Park & Choi, 2021). Reasons for the significant positive influence are that organisations with a higher internal collaboration rate have more coordination and communication within the their department (Albino et al., 2012). The higher internal coordination and communication within the organisation facilitates the adoption of processes that need to be changed through their collaboration (Theiben et al., 2014). An organisation with a higher level of internal collaboration accelerates the changes needed in the production, procurement and distribution of products as per the targeted environmental objective (Park & Choi, 2021; Theiben et al., 2014).

Informational technologies emerged as a significant internal capability that could synchronise the compatibility and cooperative attitude of the organisation internally (Bae, 2020). Informational technologies help facilitate a synchronised communication of knowledge sharing throughout the departments (Alzoubi, Ahmed, Al-Gasaymeh, & Al Kurdi, 2020). One such information technology that has been consistently identified as an internal collaboration capability that positively influences environmental collaboration is an internal environmental management system (Govindan, Aditi, Dhingra Darbari, Kaul, & Jha, 2021). Environmental management systems harbour information on environmental policy, planning, implementation, checking, and correction and management reviews (D'Souza et al., 2018). Environmental management systems facilitate the adoption, implementation and review of the internal green capabilities of the organisation by measuring both environmental and economic performance (Green et al., 2012).

An environmental management system accumulates the policies, certifications, product design and relationships that the organisation holds (Bhattacharya et al., 2013; Kuo, Hsu, Ku, Chen, & Lin, 2012). Therefore, it is evident that an environmental management system is a critical internal collaboration capability that is needed for integration, communication and the synchronisation of efforts in the supply network during an

environmental collaboration (Darnall, Jolley, & Handfield, 2008). The synchronisation of internal capabilities with the supply network aligns the commitment and value of the organisation with the targeted environmental objective (Blome et al., 2014).

Another internal capability that drives environmental collaboration is the strategic intent of the organisation, which can be categorised as reactive, compliance, innovative, or proactive (Grekova et al., 2016; Li, Qiao, et al., 2020). Another internal capability that drives environmental collaboration is the strategic intent of the organisation, which can be categorised as reactive, compliance, innovative, or proactive (Aragon-Correa, Hurtado-Torres, Sharma, & Garcia-Morales, 2008). Most organisations that take a reactive strategic intent to environmental objectives do so to preserve their reputation in the face of the many uncertainties and challenges evident in pursuing environmental objectives (Masoumik, Abdul-Rashid, & Olugu, 2015). For such organisations, to overcome the challenges, collaboration helps elevate some of the concerns about the scarcity of resources and the capabilities shared amongst the supply network (Aragon-Correa et al., 2008). Compliance strategic intent relies on environmental certification and policies to dictate the parameters of their green practices (Dangelico & Pontrandolfo, 2015). Although a compliance strategic intent does positively influence the environmental measures dictated in the certifications and policies, it doesn't further extend the organisation's resources and capabilities to actively seek other environmental objectives that need addressing (Govindan, Aditi, et al., 2021).

Innovation strategic intent exceeds the compliance intent in order to invest in research and development, resources and capabilities, towards attaining a differentiated solution to an environmental objective (Hofman et al., 2020). Organisations with innovative strategic intent strive to become industry leaders in eco-innovation and differentiate their capabilities when pursuing environmental objectives (Aboelmaged, 2018). Since differentiation is the central motivation in pursuing innovative strategic intent, organisations tend to exhibit more monitoring or transactional collaborative behaviour in their supply network (Boström, 2014). Finally, proactive strategic intent pursues environmental objectives pre-emptively throughout their operations, both internally and externally (Lin, Tsai, & Wu, 2014). Organisations with proactive strategic intent tend to exhibit a more collaborative behaviour in seeking environmental objectives within the

supply network (Wan Ahmad et al., 2016). Unlike organisations geared towards innovative strategic intent, proactive strategic intent allows companies to centre their commitment towards collaborating on the best solution in solving the environmental objective (Wan Ahmad et al., 2016).

According to Gyöngyi (2005) however, the choice of strategy for environmental collaboration depends on the organisation's productivity when thinking about their differentiation advantage in the market. The environmental strategy portfolio illustrates that low productivity and a differentiation advantage results in a resistant adaptation approach that takes a compliance stand in adapting to environmental legislations as per guidelines (Gyöngyi, 2005). The low productivity and high differentiation advantage results in a reputation approach when utilising resources towards green product design in order to sustain brand image (Gyöngyi, 2005). The high productivity and low differentiation advantage refers to a eco-efficient utilities technology and to a cost minimization approach to achieve environmental objectives through operational productivity (Gyöngyi, 2005; Sanders & Premus, 2005). Finally, organisations taking an eco-entrepreneur approach implement proactive changes, both internally and externally, to attain environmental performance regardless of recognition and brand image (Gyöngyi, 2005; Laari et al., 2016).

It is evident that internal collaboration capabilities influence the collaborative behaviour and the commitment of organisations to environmentally collaborating in the supply network (Chen, Wu, & Wu, 2015; Marhamati & Azizi, 2017). However, the overarching internal capability is consistently identified as being invested in the internal capabilities of collaboration, with the support of top management (Lee & Joo, 2020). An organisation's top management drives the motivation, intent and willingness to invest in the organisation's internal capabilities for environmental collaboration within the supply network (Bae & Grant, 2018). The top management support can be strategic, structural and relational throughout the environmental collaboration (Bae, 2020).

Strategic support refers to the direction intention and motivation that the top management seeks in their environmental collaboration when positioning the organisation as a whole (Baker & Sinkula, 2005). The strategic intent of an organisation pursuing a green supply chain versus only green procurement requires a different

degree of commitment to environmental collaboration (Cacciolatti & Lee, 2016). Furthermore, a strategic intent to be proactive in green marketing and advertising requires a strong validation of claims throughout the supply network (Fraj, Martínez, & Matute, 2011).

Structural top management support refers to the alignment of organisational and supply chain structure to facilitate environmental collaboration (Awaysheh, van Donk, & Klassen, 2010). Part of an organisational structural support involves creating collaborative departments that provide a lean and efficient operational performance in pursuing environmental objectives (Ilyas, Hu, & Wiwattanakornwong, 2020). Top management support in cultivating a green culture as part of the organisation also helps facilitate the values of environmental friendliness amongst employees (Bae & Grant, 2018). A lean organisational structure and a green culture informs employee training, flexible working arrangements and individual creativity in responding to environmental issues through innovation and with agility (Bouguerra et al., 2021) . Structural support in the supply chain design helps in the recognising the complementary resources and capabilities evident in the chain that best suit the needs of the environmental objectives in collaboration (Burgess, Lawson, Cousins, Singh, & Koroglu, 2006). It also assesses the spatial and geographical distance between partners that could provide both challenges and opportunities for environmental collaboration (Zhai et al., 2020). The relational influence of top management in the organisation is to facilitate the interorganisational and personal relationships evident in the supply network to attain a momentum for environmental collaboration(Awan, Kraslawski, & Huiskonen, 2018; Glynn, Beverland, Motion, & Brodie, 2007).

To conclude, it is evident that the internal capabilities in an organisation influences the commitment and assessment of economic vs environmental imperatives during environmental collaboration (Lee & Joo, 2020). The internal capabilities alluded to in the literature are more than just the identified top management support, the environmental management policy or the green policy (Trujillo-Gallego et al., 2021). Hence, the literature calls for further qualitative and empirical theoretical research in exploring the precursors of environmental collaboration (Govindan et al., 2019). This research aims to

respond to the call of the supply chain literature in understanding the precursors of environmental collaboration inherit in an organisation.

## 2.5 Relational Influence for Environmental Collaboration

Vachon and Klassen (2008) view environmental collaboration as a continuum with a means to an end that is both product and process orientated, beyond the scope of "focal" companies. This is in harmony with the theoretical underpinning of an inter organisational relational view, which highlights relational qualities as assets that need continuous improvement towards an elevated maturity of the collaborative behaviour in network relationships (Dyer, Singh, & Hesterly, 2018). These findings revolutionised much of the preceding research through an understanding of the synchronisation between the operational and relational components of environmental collaboration, as it identified the relational qualities that govern environmental collaboration (Vachon & Klassen, 2008). This led to the empirical scale often used to measure environmental collaboration, which includes joint product design, supplier education and support, joint planning, sharing environmental know-how, customer education and support, and making joint decisions (Vachon & Klassen, 2008). The chronological order of the relational qualities that strengthen environmental collaboration is depicted in Appendix C.

The synchronised relational effort**s** of the supply network are influenced by the patterns of negotiation and commitment that partners bring to an environmental collaboration (Westley & Vredenburg, 1991). The patterns identified include multiparty projects, joint ventures and strategic alliances, strategic bridging and mediation (Westley & Vredenburg, 1991). The choice of the collaborative pattern depends on the motivation of the partners when collaborating, which could be either egoistic or altruistic in nature (Westley & Vredenburg, 1991). The motivation and values partners have during an environmental collaboration influences the endurance of collaborative behaviour, the commitment to problem solving, and forgoing self-interest to attain a mutually beneficial, value driven collaboration (Westley & Vredenburg, 1991).

Research on enablers of environmental collaboration include in their ideas the opportunity to invest in relational assets, joint learning through knowledge exchange,

the opportunity for innovation through sharing resources and capabilities, and the effective governance of communication with partners (Arias Bustos & Moors, 2018; Touboulic & Walker, 2015). The influence of relationships and actors for environmental collaboration is evident in further research that identifies the causes of failure in collaborations (Fawcett, McCarter, Fawcett, Webb, & Magnan, 2015). Research shows that there are four types of resistance from actors, including structural and sociological aspects, organisational routines and individual skills (Fawcett et al., 2015). Structural resistors are organisational design factors that include territoriality, strategic misalignment, and poor connectivity between systems (Fawcett et al., 2015). Sociological resistors are relational factors that impact the sharing of competencies for collaboration and include information hoarding, opposition to change, and low trust (Fawcett et al., 2015). At an organisational level, the routine resistors include the intensity of the relationship, process integration, and a complex management system that made collaboration more challenging (Fawcett et al., 2015). This was more prevalent at an individual skill level, with a gap in collaborative skill sand a leadership deficit (Fawcett et al., 2015).

An overarching resistor for environmental collaboration is the resource dependency embedded in the relationships (Petersen et al., 2017). Organisations that were highly dependent in the chain expressed the necessity for partners and expertise for them to environmentally collaborate (Petersen et al., 2017). Organisations that were interested in pursuing environmental collaboration were confronted with opportunistic partners who had a dictatorial or compliance-based intention for the collaboration (Feng et al., 2020; Petersen et al., 2017). Often in such cases, an organisation was found to be compromising current operations to achieve the agenda beneficial to the partner's intentions (Petersen et al., 2017). Finally, in a very small number of cases, partners were leveraging their trusted relationships to embed sustainable objectives in the agreements (Petersen et al., 2017).

The commitment of relational actors in the supply network elevates the efforts of the supply chain for environmental performance through collaboration (van Hoof & Thiell, 2014). Therefore, a myriad of relational attributes influences the environmental collaboration, including relational alignments, power, trust, communication,

transparency, and authenticity (Brun et al., 2020; de Almeida, 2020; Petersen et al., 2017). The relational alignments that exist in a network are informed and influenced in the following four ways. Firstly, the longevity of relationships impacts a commitment to mutually set objectives (Polonsky, Lefroy, Garma, & Chia, 2011). The longevity of the relational alliance is also referred to as the history or age of the relationship between two partners (Ko, Kim, Lee, & Song, 2020). For example, the relational factors that exist between relational allies of over 10 years will be more mature when compared to a newly allied relationship (Raza et al., 2021).

Secondly, the existing relational scope impacts the environmental collaboration between partners (van der Heijden & Cramer, 2017). For example, the relational allies who are part of the existing product innovation and competitive advantage of the value chain, will have a different relational quality when compared to newly allied partners targeting environmental collaboration (Ko et al., 2020). This is because the existing relationships already contribute maturity and value as a competitive advantage throughout the chain (Gölgeci et al., 2019). Extending environmental objectives with existing value chain partners is more certain and stable (Mukhtar & Azhar, 2020). Therefore, to fully understand the myriad perspectives of environmental collaboration within the chain an in-depth knowledge of the existing relational synergy, coordination, and relational qualities needs to be explored before approaching new partners (Mukhtar & Azhar, 2020).

Thirdly, the relational factors that already exist in a partner's industrial scope will impact environmental collaboration within the supply network (Ko et al., 2020; Polonsky et al., 2011). For example, the collaboration between suppliers and manufacturers in complementary markets is very different when compared to a collaboration with competitors in competing markets and industries (Sarkees & Luchs, 2015). Hence the reflective relational factors will also vary between the two types of relationships (Li, Shi, Yang, & Lee, 2020). This will also reflect the amount of relational investment, capital and resources invested between partners to achieve the environmental objectives (Li, Shi, et al., 2020; Sarkees & Luchs, 2015).

Fourthly, the relational factors that exist at a personal level will impact the alignment of organisations within an environmental collaboration (Polonsky et al., 2011). The

personal level refers to the managerial interactions and responsibilities devoted to each partner for collaboration. The managerial response at a personal level also influences the conflict resolution between two collaborating alignments (Polonsky et al., 2011). At a personal level, the collaboration of organisations is strengthened through endorsement from personal ties, from accessibility and the sharing of resources, and knowledge and trust developed through social activities (Eng, Ozdemir, Gupta, & Kanungo, 2020). Hence, the alliance portfolio within the supply network is both horizontally and vertically myriad in nature (Ko et al., 2020; Ozdemir, Kandemir, & Eng, 2017). This is also reflected through the recovery of relational alliances during conflicts, fallouts, and accountability for future partnerships (Eng et al., 2020; Jan Hofstede, Fritz, Canavari, Oosterkamp, & van Sprundel, 2010).

The perceived effectiveness of an alignment is based on the fulfilment of responsibilities, the evaluation of the relationship's productivity, general satisfaction, and a feeling of being worthwhile (Couto, Tiago, Gil, Tiago, & Faria, 2016; Polonsky et al., 2011). To achieve this, a lucrative relational alignment is best established between those with similar cultural motivations and aims for strategic and long terms outcomes. This requires resilience in leadership and management so the longevity of the collaboration can be sustained (Nguyen, 2020; Xue, Qian, Qian, & Li, 2019).

However, all existing alliances don't possess the same amount of resources, capabilities, or a share in the market (Witek-Hajduk & Zaborek, 2020). Thus the contribution to the collaboration varies between partners, based on their dependency in the network (Meqdadi, Johnsen, & Pagell, 2020; Polonsky et al., 2011). Dependency refers to the degree of dependence an organisation has relative to their partners, which is reflective of the returns of resources and competitive advantage in the value chain (Meqdadi et al., 2020). Power is defined as the ability of an actor to influence another to act in the manner that they would not have otherwise (Talay et al., 2020). The degree of power an organisation has is directly proportional to their dependency on others in the value chain (Takashima & Kim, 2016).

A dyad relational power dependency can be buyer dominant, interdependence, independence or supplier dominance (Hogarth-Scott, 1999; Takashima & Kim, 2016). However, the power dependency within a network relationship such as a supply chain

is complex, due to the intertwined resources and competencies across industries and countries in a single value chain (Talay et al., 2020). For example, a supply network with two multinational corporations, both in manufacturing and retailing, will have a different power dependency compared to a competing value chain in smaller organisations (Mora-Monge, Quesada, Gonzalez, & Davis, 2019). Power dependence co-exists in any interaction and impacts the reactions and relational qualities of the actors involved (Chu, Wang, Lai, & Collins, 2019; Cuevas, Julkunen, & Gabrielsson, 2015; Talay et al., 2020).

Similarly, to relational alignments, power dependence also has organisational, individual, and relational facets (Cuevas et al., 2015; Sambasivan, Siew-Phaik, Abidin Mohamed, & Choy Leong, 2013). At a supply chain level, the interdependence between partners can be sequential or serial, pooled and reciprocal (Denktas-Sakar & Karatas-Cetin, 2012). Sequential or serial interdependence focuses on a unidirectional relationship; pooled interdependence focuses on the sharing of resources. Reciprocal interdependence focuses on the mutual exchanges of value between stakeholders (Dapiran & Hogarth-Scott, 2003; Denktas-Sakar & Karatas-Cetin, 2012).

The power dependence between partners can be broadly categorised as mediated power (legal, legitimate, coercive or reward), or non-mediated power (referent and expert) (Witek-Hajduk & Zaborek, 2020). Mediated power uses the explicit use of extrinsic motivation towards trying to achieve a form of action (de Jong & Benton, 2019). This is done through establishing contracts and punishment or reward in exchange for compliance. Non-mediated power is a cognitive state that develops over time and is perceived to be valuable by association with the other party (de Jong & Benton, 2019). The many power symmetries that exist within the supply network results in mediated power being more goal orientated, which has a negative consequence on the relational quality (de Jong & Benton, 2019; Witek-Hajduk & Zaborek, 2020). Non mediated power is perceived as being more value orientated and it positively impacts relational quality (de Jong & Benton, 2019). The ways partners exert power in their interactions creates a transformational or locked in relationship (Grandinetti, 2017). Throughout the relationship, power dependency can be categorised as exertion, origin, dynamics, and the use and measurement of power (Talay et al., 2020; Wankhade & Kundu, 2020).

However, a higher exertion of power dependence between the partners may lead to a "monitoring" or "transactional" relationship (Jarratt & Morrison, 2003; Meqdadi et al., 2020). The principle of power governance within the chain is often such that an organisation with the most power will exert coercive power to initiate and moderate changes in the chain to mould it to its own preference and objectives (Chu et al., 2019; Jarratt & Morrison, 2003). A network level example of controlling relationships based on power dependence includes price through market driven knowledge, inventory, operations, channel structure and information control (Chu et al., 2019; Munson, Rosenblatt, & Rosenblatt, 1999). In pursuit of balancing the power dependence, organisations avoid compromising, competition, accommodation, or finally collaboration (Al-Khatib & Vitell, 2000; Hogarth-Scott, 1999; Wang, Wang, & Liu, 2020).

Some researchers note that at a network level, the distance of partners and the degree of dependency will influence the exertion of power (Sambasivan et al., 2013). At a network level, if there is a low dependency on and a high distance from partners, then the relational quality is non-compliance or transactional in nature (Rezaei Vandchali, Cahoon, & Chen, 2020). In a noncompliant relational strategy, the partners do not address sustainable issues in the chain. This could also be a result of lower dependency of partners on each other's value chain (Rezaei Vandchali et al., 2020). A transactional relational strategy is best suited between partners who must respond to sustainable issues due to external pressures. However, they do this in a contractual and one-off basis to comply with the minimum benchmark of sustainable standards (Rezaei Vandchali et al., 2020). This could also be because of a highly spatial disparity between partners with some interactions in the value chain (do Canto, Bossle, Vieira, & De Barcellos, 2020; Rezaei Vandchali et al., 2020). In a dictatorial relational strategy, a focal company has a higher power dependence and uses their exertion of power to dominate and dictate the sustainable objectives that need to be attained (Dania, Xing, & Amer, 2018; Rezaei Vandchali et al., 2020). The focal company using a dictatorial strategy often implements their own standards, code of compliance and auditing to ensure a partner's compliance. Finally, a transparency in relational quality engages in a collaborative way with relational strategy (Rezaei Vandchali et al., 2020; Scandelius & Cohen, 2016). A collaborative relational strategy engages the network of partners in the supply chain with exchanges of value co creation (Rezaei Vandchali et al., 2020; Scandelius & Cohen, 2016).

However, others view power symmetry as a moderating agent between partners, which aids in embedding the relationship with legitimacy, thus providing opportunities (Morgan, Anokhin, & Wincent, 2016; Sambasivan et al., 2013). Such opportunities could include exposure to more resources, opportunities and markets, with an eye towards further collaboration (Morgan et al., 2016). Leadership's role in recognising and taking advantage of such opportunities within each organisation is critical (Morgan et al., 2016; Sambasivan et al., 2013). At a network level, the higher the power symmetry between collaborating partners is, the more successful it is in entering markets, followed by an increase in product innovation and commercialisation (Morgan et al., 2016). Research shows that power symmetry does moderate the environmental practices of collaborating partners, which creates a more satisfied relational alignment (Norheim-Hansen, 2018; Prasad, Zakaria, & Altay, 2016).

Collaborating with trustworthy partners reduces the perceived risks of commitment in achieving mutually beneficial objectives (Norheim-Hansen, 2014). The trustworthiness, integrity, and benevolence evident in the supply network influences their collaboration (Canavari, Fritz, Hofstede, Matopoulos, & Vlachopoulou, 2010; Norheim-Hansen, 2014). Commitment is defined as the partner's degree of loyalty towards continual cooperation in the relational alignment (Sandra Simas Graça, Barry, Kharé, & Yurova, 2021). Research shows that uncertainty in a situation is demonstrated a short term orientation of commitment to the partnership, while others believe it is a demonstration of a lower moral code (Gill, Flaschner, & Shachar, 2006; Sandra Simas Graça et al., 2021). This is important to understand, as the environmental or sustainable objectives are critical, yet their outcomes are situationally based, uncertain, complex, and intangible (Sandra S. Graça, 2021). This then heightens the inherit significance of relational trust towards achieving unwavering commitment between partners (Theron, Terblanche, & Boshoff, 2011).

Creating a fundamental trust in a network of relationships such as a supply chain is very complex, as competition with competitors is common. Motivations and objectives vary across partners, and language and cultural differences are overtly visible across the chain (Chang, Ouzrout, Nongaillard, Bouras, & Jiliu, 2014; Crane, 1998; Houjeir & Brennan, 2016). Across cultures the value of kinship, personal ties, self-sacrifice, loyalty,

promise fulfilment, emotional loyalty, altruistic benevolence, and moral obligation differ (Hoejmose, Brammer, & Millington, 2012; Houjeir & Brennan, 2016; Jan Hofstede et al., 2010). Finding shared values where companies wish to shape a trusting strategic alliance is complex, made under social or competence based decision making (Houjeir & Brennan, 2016; Jan Hofstede et al., 2010).

The level of trust and commitment embedded in the relationship is reflective of the amount of investment, resources and competencies that partners are willing to continue to share freely to attain their objectives (Beer, Ahn, & Leider, 2018; Hoejmose et al., 2012). This is important to note, because if a relational alignment doesn't have trust then organisations refrain from sharing potential competencies and invest in increasing their own capabilities towards a competitive advantage (Beer et al., 2018). For example, in a relationship that has low capability and commitment, there is limited trust for any form of interaction (Fawcett, Jones, & Fawcett, 2012; Shih, 2013). In such a situation the supply chain network fails to perform. In a relationship that is high in capability but low in commitment the trust is performance based (Fawcett, Jones, et al., 2012; Shih, 2013). In a such a situation the supply chain partners perform short term promises. In a relationship with low capability but high commitment there is commitment-based trust (Fawcett, Jones, et al., 2012; Shih, 2013). In this situation, the resources and competencies within the partnerships do not mesh in terms of further collaboration and innovation. Finally, in a relationship with high capability and high commitment firms, there is a collaborative trust (Fawcett, Jones, et al., 2012; Shih, 2013). In such a situation there is a breakthrough opportunity for collaboration to occur in the network towards continuous competitive advantage of the supply chain.

Research shows that regardless of the power dependence, low levels of trust also change the nature of a relationship to something that is transactional based and governed by contracts (Graça, Barry, & Doney, 2016; Handfield & Bechtel, 2002). Therefore, trust and commitment to the relationship are moderators in maintaining the relationship (Graça et al., 2016). High levels of trust reduce uncertainty and opportunism, while enhancing commitment and satisfaction on a personal level, which leads to reinforcing interorganisational ties and innovation (MacDuffie. & Helper, 2007; Michalski et al., 2019).

Relational trust and power dependence between partners impacts the type of collaboration evident in the chain (Brun et al., 2020; Feng et al., 2020). If the partnership is contractually based with high dependence, the collaboration is a basic monitoring that involves setting policies, compliance checks, and a low level of engagement by the partners (Brun et al., 2020). Another perspective on a contractual agreement based on a partnership yields a more collaborative behaviour with a selected number of suppliers by setting corrective action plans and conducting audits (Brun et al., 2020). Partnerships with a more trust-based relationship involve a monitoring perspective, providing trainings and tools for suppliers to develop (Brun et al., 2020). Finally, a longer partnership with high levels of trust that leads to an optimum collaboration level through the joint development of activities, and by providing financial and technical support (Brun et al., 2020). It is important that partnerships reach a collaborative level in the supply chain to increase organisational visibility, downstream integration, and building capacity by using scientific tools to measure performance indicators. They need to disclose supply and demand information and to finally share, engage in and join forces through the stakeholders in the supply chain (Brun et al., 2020; Kuiti, Ghosh, Basu, & Bisi, 2020).

Communication is defined as the formal and informal exchange of information and knowledge between partners (Rosenbloom & Larsen, 2003). Communication between partners encourages collaboration if it is in a high frequency, is a routinized interaction, allows for reciprocal feedback and is rational (Susanty, Bakhtiar, Jie, & Muthi, 2017). Communication comes with the willingness to share meaningful information and knowledge for the betterment of the relationship (Hänninen & Karjaluoto, 2017). Like the interrelationship of other relational qualities, the higher the level of trust, the more partner's communicate meaningful information to strengthen the relational alliance (Li, Wang, Shaw, & Shi, 2019).

Since communication is personal and situational based, for it to be effective the quality of the communication is important. This involves accuracy, being timely, and credible and complete information between partners (Sandra Simas Graça et al., 2021). This then conveys a positive evaluation of judgement between partners towards a continuous trust in cooperation and the alignment of mutually beneficial objectives (Mendoza-Fong

et al., 2018). Communication quality is critical in exchanging information in a network and supply chain setting, as the expertise and knowledge of all partners varies across the chain. It is significant when setting effective environmental objectives (Li, Wang, et al., 2019).

Formal communication is important when sharing and reporting on the information and knowledge embedded in the operations of the supply chain. However, informal communication is equally significant when building relational confidence, integrity, and reliability (Richard, Thirkell, & Huff, 2007). Formal communication is more regular and structured between institutional partners, while informal communication is often spontaneous and non-regularized at an interpersonal level (Sandra Simas Graça et al., 2021). Formal communication, such as contractual terms, are perceived as "governance" or "safe guards" against opportunistic behaviours in the relational alignments (Høgevold, Svensson, & Roberts-Lombard, 2020). Formal communication is perceived as the efficiency of information exchange, while informal communication adds legitimacy to the exchange while solidifying relational trust (Barry, Graça, Kharé, & Yurova, 2021). Formal communication is perceived as the efficiency of information exchange while the informal communication provides legitimacy to the exchange while solidifying relational trust (Barry et al., 2021). The mode of communication must be appropriate to the communication task, and, depending on the formality that exists between partners, it impacts how the message is perceived (Li, Wang, et al., 2019; Vieira, Winklhofer, & Ennew, 2014). The ambiguity of the message also impacts the appropriate choice of the mode of communication between partners (Murphy & Sashi, 2018). A one-way communication reduces collaborative behaviour and encourages a dictatorial or transactional relationship between partners (Myhr, Hausman, & Spekman, 2005; Salomonson, Åberg, & Allwood, 2012).

Finally, proximity within the supply chain also impacts the quality of communication. Partners within a closer geographical distance, who have a similar language, will have clearer communication, compared to other partners who don't share their languages (Li, Wang, et al., 2019; Rosenbloom & Larsen, 2003). Communication is critical in bridging the values of partners when attempting to achieve a common objective (Nes, Solberg, & Silkoset, 2007). Shared values are also a path to understanding the cultural

values and norms that define how alliances are perceived and trusted in various vertically dispersed partners in a supply chain (Doney, Arnott, Barry, & Abratt, 2007; Lohtia, Bello, & Porter, 2009). For a seamless interaction and engagement with environmental collaboration , partners need to have cultural intelligence (Awan et al., 2018).

Transparency is defined as the evaluation of the information quality provided by the organisation (Yang & Battocchio, 2020). Fundamentally, transparency refers to disclosure, clarity and the accuracy between two partners (Yang & Battocchio, 2020). Establishing transparency in the relationship is a deliberate effort to positively enhance the strategic alliance (Bastian & Zentes, 2013; Lin, Eisingerich, & Doong, 2017). Hence, transparency can be either at a personal or institutional level, given all the types of stakeholders in an organisation (Cicala, Bush, Sherrell, & Deitz, 2014; Lin et al., 2017). The transparency demonstrated at a personal level bridges the “access” and “use” of information for partners, which reflects the institutional level of transparency, commitment, and trust among partners (Bastian & Zentes, 2013; Cicala et al., 2014). Transparency of information is classified as information shared, information relevancy,, as a and information latency (Goswami, Ravichandran, Teo, & Krcmar, 2011; Hernández-Espallardo, Rodríguez-Orejuela, & Sánchez-Pérez, 2010). Information shared refers to the type of information shared among partners such as forecasting, planning, product design and production scheduling (Goswami et al., 2011; Hernández-Espallardo et al., 2010). Since each supply chain partner provides its own distinct value and competence the information shared within the chain is often asymmetry in nature but equally important to make strategic decision making based on a more complete information (Goswami et al., 2011; Hernández-Espallardo et al., 2010). The core ethos of transparency is communicating accurate information; hence sensitivity of information is a significant attribute to consider (Srivastava Dabas, Singh, Sternquist, & Mahi, 2012; Yang & Battocchio, 2020). The sensitivity of information being shared makes transparency a double-edged sword, on the one hand the organisation is being transparent about operations while on the other hand criticism and audits could arise as a result of being transparent (Lee & Park, 2016; Lin et al., 2017).

Part of enhancing transparency between network partners in a chain is providing access to internal information for external use (Brun et al., 2020). Often a supply chain is known as the black box of knowledge and information that is not accessible to all partners but has a domino effect on the operations of the whole value chain (Egels-Zandén, Hulthén, & Wulff, 2015; Rezaei Vandchali et al., 2020). Transparency of information is critical for collaborative partners to set environmental objectives based on realistic capabilities and knowledge (Brun et al., 2020; Egels-Zandén et al., 2015). In reality partners are often cautious of transparently sharing their knowledge and information hence, transparency and traceability is a significant issue in supply chains (Brun et al., 2020). The hesitancy comes from supply chain partners perceived such information as proprietary, economic and competitive value (Egels-Zandén et al., 2015).

At a relational network level in a supply chain transparency of information include sustainable reports, environmental product declaration and sustainable certifications (Kahlenborn, 1999; Rezaei Vandchali et al., 2020). Others view transparency within the chain as product flow tracking, traceability of supplier's conditions, accurate reporting on social and environmental issues and transactional reporting between buyer and supplier (Egels-Zandén et al., 2015). Such information should be available in terms of quality and quantity for all stakeholders in the network to increase transparency, assurance and brand reputation (Dhanesh & Duthler, 2019; Rezaei Vandchali et al., 2020)

Although the automation of many operations in the supply chain has improved the sharing of information and knowledge across the chain, the relational transparency is yet to be explored (Bourne, 2020; Zhu, Song, Hazen, Lee, & Cegielski, 2018). The automation of the information processing does increase the sharing information and knowledge capability within the firm that reduces the relational uncertainty between partners (Zhu, Song, et al., 2018). The influence of automation and IT has made information sharing more traceable and credible that increases relational satisfaction and trust (Hernández-Espallardo et al., 2010; Medina & Rufín, 2015).

In another perspective transparency is also defined as the individual's subjective perception of being informed about the relevant actions and properties of the interactions in the partnership (Hultman & Axelsson, 2007; Nguyen, Jaber, & Simkin,

2020). This is the relational perspective of transparency that encourages interactive relationship that brings partners closer together (Nguyen et al., 2020). Hence, embedding transparency in the relational networks often provides visibility to partners that have information to share and exchange but are often overlooked from upstream players due to power, size or position in the chain (Goswami et al., 2011). This relational visibility is often bridge between information sharing and relational alliance perspective of transparency in a supply chain (Goswami et al., 2011).

Authenticity refers to truthfulness, sincerity, stability, endurance, consistency, credibility, originality, geniuses, realness and dissociations from commercial motives (Burnett & Hutton, 2007; Yang & Battocchio, 2020). Since the perception of truth and realness shift over time, authenticity is also time bound and can evolve over time (Beverland, 2005; Blackford, 2011). The study of authenticity stemmed from ethics behaviour and focused on commitment and true to one's own self values (Ilicic & Brennan, 2020; Wellman, Stoldt, Tully, & Ekdale, 2020). Others perceive authenticity as a medium that exits between the sincerity of self and the perception of others on this (Apostolakis, 2003; Speed, Butler, & Collins, 2015).

Authenticity in the relationship marketing context is in the early stages of understanding (Dickinson, 2011; Shams, 2015). A possible reason for this is that authenticity surpasses trust, commitment, communication and transparency (Chhabra, Zhao, Lee, & Okamoto, 2012; Dickinson, 2011). Authenticity is developed as a two way interaction over an extended amount of time surpassing satisfactions through consistent commitment, communication and trust recovery between partners (Dickinson, 2011; Jun & Yi, 2020). Besides longevity another unique attribute of authenticity is the conceptual construct that is developed at a dyad and triadic interaction over an extended amount of time but is evolving based on myriad of perspectives (Chhabra et al., 2012; Dickinson, 2011). Therefore in relation to relationship marketing authenticity is a reflexive process that is dynamic in nature and ever evolving in an extended amount of time (Plüg & Collins, 2020).

Another spectrum of authenticity worth more scholarly attention is authenticity at a production stage in a supply chain (Ranfagni & Guercini, 2014) . The complexity of a supply chain in terms of structure, organisational power symmetry, multiple relational

alignments with myriad relational qualities impact the perception of authenticity at personal, institutional and network level (Ranfagni & Guercini, 2014). For example at a personal level authenticity can be eminent at a dyad and triad level but not necessarily reflective of the authenticity in the supply chain as a whole (Ranfagni & Guercini, 2014). Research shows, to reflect the personal authenticity to production of the supply chain to stakeholders types of self-authentication has to be evident (Ranfagni & Guercini, 2014). Self-authentication in the supply chain can be categorises as real, evocative, participative and cohesive (Ranfagni & Guercini, 2014). Real self-authentication focuses on the natural essence used in the production this could be any natural resource that is rare, scarce and genuine to an origin (Hollebeek & Macky, 2019). Evocation self-authentication focuses on the paradox of tradition versus modernity in style of production(Ranfagni & Guercini, 2014) . Participative self-authentication refers to the final perceive value of the final product focuses on territorial versus business values(Ranfagni & Guercini, 2014) . Finally cohesive self-authentication refers to individualism and collectivism perspective of supply chain partners in nurturing the authenticity of the raw material or commercialising it for mass production regardless of its native values (Ranfagni & Guercini, 2014).

There are many academic literatures identifying the relational factors that exist between dyad and triad organisations (Cheung, Myers, & Mentzer, 2011; Swierczek, 2019). However from a relational network lens the factors that facilitate collaborative partnership in an uncertain and challenging context like environmental objectives need further exploration (de Almeida, 2020). Therefore, the relational qualities that influence the strength and momentum of environmental collaboration in the supply network are alignment, power, trust, communication, transparency, and authenticity.

## 2.6 Theoretical Underpinnings of Conceptual Framework

This research draws from two overarching theories namely natural resources-based view and interorganisational relational view. Firstly, a natural resource based view helps to identify the resources and capabilities that are rare, valuable and unable to be substituted to create a competitive advantage (Hart, 1995). A natural resource-based view underpins this research, which explores the resources and capabilities that are needed in the supply network to enable environmental collaboration (Fraj, Martínez, &

Matute, 2013; Ren et al., 2019). Identifying the resources and capabilities needed for environmental collaboration is essential in maintaining the momentum of the supply network in terms of the green or sustainable supply chain, and the circular economy (Crenna, Sozzo, & Sala, 2018). The resources and capabilities that are then identified could be classified as pollution prevention, product stewardship or sustainable development (Hart, 1995). A supply chain is a network of partnerships, which has a variety of suppliers, manufacturers, logistics and retailers across multiple industries (Chand, Thakkar, & Ghosh, 2020). Therefore, each partner across the different tiers, industries and regions can provide a unique resource or capability to inform the environmental collaboration (Govindan et al., 2019). Finally, research finally, also explores the precursors of environmental collaboration. The internal resources and capabilities needed to drive environmental collaboration at a firm level are also supported by a natural resource-based view (Bae, 2020). The application of this theory is further explored in the proceeding sub section.

Interorganisational relational views is used to underpin the relational rents that exists in the supply network (Dyer & Harbir, 1998). The relational rents are relational specific assets, knowledge sharing routines, complementary resources and capabilities, and effective governance (Dyer & Harbir, 1998). Environmental collaboration is based on the synchronisation of the resources and capabilities embedded in the supply network and the commitment to the environmental objectives by the partners in the network (Gölgeci et al., 2019). An interorganisational relational view helps to identify the relational rents that were used to strengthen environmental collaboration amongst supply networks. By underpinning this research to the theoretical lens of a relational view, the relational specific assets, type of knowledge and knowledge sharing routines, complementary resources and capabilities and the effective governance needed from each type of partnership for environmental collaboration is explored (Srivastava, Srinivasan, & Iyer, 2015). Therefore, the relational view sheds light on the different relational rents evident in the supply network based on the alignments that exists (Gölgeci et al., 2019). The types of alignment that make up the network possess unique relational rents that bind the partnerships towards operational and environmental collaboration to attain competitive advantage (Michalski et al., 2019). The supply network is a result of existing longevity, commitment, trust and dependency between

partners in a dyad, triad and myriad intensities (Michalski et al., 2019). Hence relational view complements this research's objective in understanding the relational rents that exists in the supply network to sustain the momentum and commitment of partners for environmental collaboration (Vachon & Klassen, 2008). The further application of theory is synthesised in the proceeding section.

The rationale for the application of each theory is the following. Firstly, environmental collaboration occurs in a context in which the supply network is already collaborating for operational performance (Trujillo-Gallego et al., 2021). Therefore the natural resource based view and the relational view are complementary theories, which helps this research to identify existing or complementary versus further resources and capabilities needed for collaborating for environmental objectives (Arora & Arora, 2020). Secondly, a natural resource-based view helps identify a firm's level of the resources and capabilities needed for environmental collaboration. This is needed in the exploration of the precursors of environmental collaboration (Dyer et al., 2018; Michalisin & Stinchfield, 2010). Finally, while a natural resource based view helps identify the firm's level of their control of resources and their capabilities for environmental collaboration, the relational view helps apply the identified resources and capabilities in a context of a myriad of collaborative relationships that possess relational attributes, which influences exchanges and collaborations in the supply network (Dyer et al., 2018; Hart, 1995). Therefore, both natural resource-based views and inter organisational relational views are complementary when exploring the precursors of environmental collaboration and the relational factors that bind environmental collaboration. The proceeding sections discusses both theories in depth and their contributions to the theoretical model developed in this research.

### 2.6.1 Theoretical Underpinnings of Natural Resources Based View

The resource based view identifies the internal and external capabilities of a firm to be valuable and costly to replicate, which would create a sustainable competitive advantage (Barrutia & Echebarria, 2015; Oliver, 1997). However, given that resources and capabilities can be considered valuable and that there is no substitute, it has to be tactical, socially complex and rare (Peng, 2001; Wernerfelt, 1984) . The natural resource

based view incorporates the influence of the natural environment on a firm's ability to create a sustainable competitive advantage (Hart, 1995; Michalisin & Stinchfield, 2010).

This theory complements the context of this research well, since supply networks are bound by the constraints and liberties of the resources they possess, which are influenced by the natural environment and by the ecosystem they reside in and have access to (Alfalla-Luque, Machuca, & Marin-Garcia, 2018; Prasad & Tata, 2010). The supply network can also be held responsible for the environmental impacts and issues that exist in the locality and regions in which they operate in (Carter & Jennings, 2002; Yang, Lau, Lee, & Cheng, 2020). Furthermore, consumer and governmental pressures in value chains that bear a responsibility for their environmental impact is rapidly increasing (Ilyas et al., 2020; Sang Baum Kang, Jing Li, & Jiong Sun, 2021). Each collaborative partner's commitment to pursuing green issues varies, based on their environmental impact and the regions in which they reside (Jahanshahi & Brem, 2018). Therefore, the natural resource-based view is a complementary theory that underpins the resources and capabilities that are needed for environmental collaboration in a supply network. A natural resource-based view provides the lens through which resources can be considered as a competitive advantage, which should be rare, valuable, and non-substitutable. This could either be pollution prevention, product stewardship or sustainable development (Hart, 1995; Hart, Barney, Ketchen, Wright, & Dowell, 2010).

Pollution prevention is considered as capability building with the intention to minimise emissions and waste, which requires continuous improvement but is a low-cost and attainable competitive advantage (Hart, 1995; Hart et al., 2010). In this research, some of the pollution prevention capabilities were identified as the compromise of green product development and the incorporation of green processing. In compromises that mean green product development uses more recyclable materials, green raw materials, or the increasing quality of the product to extend its life cycle were common capabilities adopted by organisations as a pollution prevention capability. When incorporating green processing recycling, waste management and reusable energy emerged as capabilities that reduce cost over time yet prevent further environmental pollution. These findings concur with previous pollution prevention capabilities identified in the

literature, which note that continuous research and development, innovation and green knowledge is needed to sustain an organisation's competitive advantage over time (Al-Sheyadi, Muyldermans, & Kauppi, 2019; Miemczyk, Howard, & Johnsen, 2016).

Product stewardship incorporates the involvement of external stakeholders to minimise the lifecycle costs of products (Hart, 1995; Hart et al., 2010). In this research, the product stewardship capabilities that are integrated into the supply network incorporate green processing, coordinated environmental collaboration and defining partner roles during the supply chain environmental collaboration. Through incorporating green processing, firms have assessed the capabilities they need from the supply network to further green issues. During green processing, suppliers and manufacturers incorporate eco-design, flat packaging, green transportation and more. The coordination of environmental collaboration, resources and capabilities are further refined in seven steps. The roles of partners in contributing their distinct capabilities are identified in the defining partner roles. However, as the environmental issues in the supply network evolve the product stewardship capabilities are further refined and developed. These findings extend current academic knowledge in understanding the different components in supply chain environmental collaboration (Albino et al., 2012; Arora & Arora, 2020).

Sustainable development refers to the shared vision and future position of an organisation in minimising their environmental burden while sustaining economic growth (Hart, 1995; Hart et al., 2010). The sustainable development capabilities identified in this research are supply chain and industrial environmental collaboration. This research alluded that to increase the adoption of environmental collaboration throughout the supply network the trade-offs and costs need to be lowered. To do this, the supply networks need to strive for industrial environmental collaboration, which increases the scale of green production. Once an economy of scale of green production is attained, the costs will decrease and the adoption of environmental collaboration throughout the industry will increase. These findings address the green production versus green demand gap, which is identified as a barrier in environmental collaboration in the supply chain literature (Shao & Ünal, 2019). Two critical capabilities that facilitate the sustainable development of an environmental collaboration are understanding the stages of environmental concern, and relational factors. By understanding at which

stage of environmental concern the partners are committed to, the needed for environmental collaboration can be assessed. The relational factors help further strengthen the environmental collaboration through time (Vachon & Klassen, 2008).

Furthermore, as supported by the natural resource based view, all three capabilities are path dependent and embedded in nature (Hart, 1995; Hart et al., 2010). This research concurs with the theoretical reasoning of the natural resources-based view in terms of path dependence and embeddedness (Hart, 1995). Path dependence reiterates that to acquire a sustainable competitive advantage, the green orientation, environmental collaboration and relational factors need to be acquired in a sequential manner (Hart, 1995). An organisation can begin to collaborate environmentally with supply networks; however, it is best to assess the commitment and stage of concern with green issues. If the organisation is in a disregarding stage of environmental concern, their commitment to the uncertainties and risks during a supply chain environmental collaboration will waiver. Furthermore, without an assessment of plausible green practices, organisations can pursue coordinating environmental collaboration. However, the transition and changes acquired during collaboration might risk the economic performance of existing processes. Hence, it is best to first assess the plausible green practices the organisation is willing to adopt internally before engaging with supply networks. However, the development of a green organisational orientation, environmental collaboration and relational factors are not mutually exclusive, rather than embedded over time. The path towards sustainable development is not linear and cannot be quantified through performance measurements. Rather, it is a parallel loop that needs facilitation, moderation, and adjustments to further develop itself as valuable and rare, with non-substitutable resources and capabilities (Um & Kim, 2019).

### 2.6.2 Theoretical Underpinnings of the Interorganisational Relational View

The natural resource based view gives a firm analysis of the resources and capabilities however the relational view identifies relational networks as a resource for competitive advantage (Dyer et al., 2018). The interorganisational relational view concurs with a natural resource-based view that resources should be rare, valuable and not able to be substituted to have a competitive advantage (Dyer et al., 2018). However, organisations do not reside in a vacuum, but rather in a network of relationships that influence the

competitive advantage of resources and capabilities (Dyer, Singh, & Kale, 2008). Hence, simultaneously sharing resources and capabilities while maintaining an organisational competitive advantage through collaboration, draws specifically from a relational view (Dyer & Hatch, 2006). Moreover, the theoretical lens of a relational view takes the perspective that the relational investment that exists in the ecosystem is in fact a valuable, rare and non-substitutable resources that provides a unique competitive advantage in the performance of the network over all (Dyer et al., 2018). This perspective translates exactly to the context of supply chains, due to two dominate reasons. Firstly, once a disruption occurs in parts of the chain, a bullwhip effect occurs on the performance of others (Sirikasemsuk & Luong, 2017). The network of ecosystems is thus interdependent, given the relational investment of all the partners involved. Secondly, the external factors that influence the risks and uncertainties in supply chains are many, hence the resilience amongst the network of partnerships is paramount (Ji et al., 2020).

The theoretical rationale of the relational view is evident in supply networks, as the performance of the environmental collaboration is reliant on the commitment, availability and synchronisation of dependencies amongst partners (Li, Qiao, et al., 2020; Yu & Huo, 2019). Through the joint sharing of resources and capabilities, the bargaining power of the supply network increases, which influences both industrial environmental collaboration and economies of scale in green production (Ma, Opp, & Yang, 2020; Tiwary et al., 2013). This research, therefore, responds to current criticism from the supply chain literature by exploring the network of relationships as a more precise method when investigating supply chain measures, rather than having a dyad or triad perspective (Jraisat et al., 2021).

In this research, a dichotomy emerged from the perspective of the theoretical lens of the interorganisational relational view of environmental collaboration. The contribution of this research is that the sharing of resources, capabilities and knowledge is at the core of striving for environmental collaboration. However, the risks, uncertainties and trade-offs that exist also lead to a potential loss of competitive advantage (Michalski et al., 2019). Hence the monitoring, reporting and alignment of environmental collaboration is instrumental in strengthening the relational bond between the collaborative partners

(Meqdadi, Johnsen, & Johnsen, 2015). The relational rents that underpin a relational view are relationally specific rents, knowledge sharing routines, complementary resources and capabilities and effective governance (Dyer & Harbir, 1998). An interfirm relational specific asset is defined as a firm's specialised or unique assets among the partners that has become a competitive advantage (Dyer & Harbir, 1998). The three types of interfirm relational specific assets are site specificity, physical asset specificity and human asset specificity (Dyer et al., 2018).

Site specificity refers to spatially close site investments that can reduce costs (Dyer et al., 2018). In this research, site specificity rents were evaluated during the restructuring of the supply network and through identifying existing resources and capabilities (Jo & Kwon, 2021). During restructuring, the supply network partners assess the design of the supply network in relation to position and spatial distance (Arora & Arora, 2020). In fact, the closer and leaner the supply network was when restructured, the less that carbon emissions occurred during freighting (Guo, Liu, Liu, & Guo, 2017). When identifying existing resource and capability steps in the coordination of environmental collaboration, the partners assessed plausible relational investments based on their existing resources and capabilities. In fact, in this process the sharing of resources and capabilities occurred in the form of setting up waste management, recycling, and water management systems for sub-tier suppliers to reduce their environmental impact.

Physical asset specificity refers to transaction-specific capital investment between partners (Dyer et al., 2018). In this research, incorporating green processing begins the physical asset investment of relational partners which could include recycling, waste management or water management systems. During the defining partner roles further, physical assets were recognised for investments. For example, green transportation was a physical asset that logistic partners could provide for an environmental collaboration. Manufacturers emerged as hubs for collaboration and green manufacturing due to their role and position in the value chain. Finally, the unifying green standards worked through the coordination of environmental collaboration partners invested in environmental management systems, certifications, and schemes to create synchronised and complementary measures amongst supply networks when working to attain green issues.

Human asset specificity refers to the transaction-specific know how accumulated through long-standing relationships (Dyer et al., 2018). In this research, human asset specificity is evident when identifying resources and capabilities, integrating information and knowledge, and communicating green knowledge. This research extends this scholar's understanding that green knowledge and solutions are found at the research and development phase, and is not commonly shared amongst supply networks (Cheng, 2011; Pham & Pham, 2021). This appears to be contradictory, as green knowledge is rare and valuable participants stigmatize the sharing of knowledge as they perceive they are forgoing a competitive advantage (Kong, Feng, Huang, & Cai, 2020). Yet human knowledge and expertise is a rare and valuable resource that is needed to drive environmental collaboration. Hence, when identifying resources and capabilities, sustainable expertise and committed collaborating partners emerges as a rare resource needed to sustain the momentum of environmental collaboration. During the integration of information and knowledge, the supply network was aggregated to combine the fragmented information and knowledge needed for decision making in environmental collaborations. Finally, communicating green knowledge is a valuable and rare asset that is needed to be acquired throughout the supply network to sustain its further development.

The relational view further identifies the safeguarding of relational specific assets as the longevity of relationships and the volume of interfirm transactions (Dyer et al., 2018). The longevity of relationships was reaffirmed in this research when establishing green supply alignments and trust in green alignments. When establishing green supply alignments, existing partners were preferred due to the longevity and stability of the relational rents residing in the supply chain network. Trust in green alignments and the commitment and relational recovery and stability between existing partners were reasons that long-term partnerships were preferred in environmental collaborations. The volume of interfirm transactions refers to the further development of relational rents and assets due to increasing interaction between partners (Dyer et al., 2018). In this research, the further development of supply chain environmental collaboration was found to result in cooperation between competition and the involvement of associations that lead to industrial environmental collaboration. However, relational factors remain the core influence when strengthening the relational assets during collaboration.

Interfirm knowledge sharing routines are defined as the regular patterns of interfirm interactions that permit the transfer, or combines and creates specialised knowledge (Dyer et al., 2018). This research further reaffirms the current literature in the importance of knowledge integration and management for environmental collaboration (Ji et al., 2020). The development of environmental collaboration over time is based on integration of information and knowledge, forming communication channels, and communicating green knowledge. These capabilities aggregate the supply network and share the green knowledge that is needed to make decisions when working on green issues. The interfirm knowledge sharing capabilities builds the resilience of partners during environmental collaboration (Li, Zhou, & Wu, 2017).

The safeguards of knowledge sharing identified in the relational view are the absorptive capacity of partners, and incentives that encourage transparency (Dyer et al., 2018). T Absorptive capacity refers to the recognition and assimilation of knowledge between partners (Aboelmaged & Hashem, 2019) . This fact that emerged in this study when defining partner roles where the specific knowledge that exists between partners is defined. For example, suppliers could have a significant knowledge of sustainable raw materials, which could be shared with manufacturers during the eco-designing of a product. Manufacturers emerged as knowledge hubs that could integrate information and knowledge upstream and downstream throughout the supply networks. Logistics have knowledge of green transportation and lower carbon routes to provide the supply network with. However, an interesting finding was the new theoretical perspective of the role logistics had to share information on other plausible industry partners who wanted to environmentally collaborate. Retailers have a knowledge of market demand, which is needed to make projections for green production. They could also design educational and engaging green promotional messages that communicate the authentic green stories evident during environmental collaboration. Finally, associations could provide industry specific solutions for green issues to help facilitate and moderate environmental collaborations between competitors to elevate efforts in industry collaboration.

The safe guard of incentives to encourage transparency and discourage free riding has emerged as being more relational based than transactional in this research (Dyer et al.,

2018). The preferred choice of partner for an environmental collaboration were existing partners, due to the complementary processing of existing operational collaborations. Hence, economic imperatives already existed for an interfirm sharing of transparent information. However, more commitment and relational investments were expected since the uncertainties, risks and trade-offs of environmental collaboration was more than operational collaboration. Therefore, transparency in sharing green resources and capabilities and authenticity in green supply networks emerged as relational factors that ensure openness, accessibility, a genuine approach, and sincerity amongst collaborative partners. This was further reinforced through the constant environmental reporting and monitoring of environmental practices. The best form of relational alignment was being in an alliance with others at a similar stage of environmental concern, rather than incentivising partners commitment and transparency to environmental collaboration. This is because the return on investment of environmental collaboration could be intangible in nature and the measurement of progress still in development. Hence, incentivising transparency could lead to reduced efforts since it cannot be objectively measured.

Complementary resource endowment refers to the distinctive resources of alliance partners that collectively generate greater rents than the sum of those obtained from the individual endowments of each partner (Dyer et al., 2018). Complementary resource endowments that were distinct resources are made better through collaboration when assessing plausible green practices. Assessing plausible green practices began as an internal green orientation, however the more collaboration that occurs, the closer the organisation is in striving for a supply chain environmental collaboration. Green promotion emerged as the resources and capability in the tiers of the supply network. Collaborative green promotion results in credible and validated green messaging that addresses a customer's scepticism about it. The value of pursuing green issues is shared throughout the collaborative supply network through a shared green promotional campaign. Environmental issues are complex and evolving in nature, which needs a further investment of extensive resources and capabilities from an industrial perspective to resolve.

The safeguard of complementary resource endowments is the synergy of complementary resources and capabilities between alliances (Dyer et al., 2018). In this research, the synergy of complementary resources and capabilities is established through relational factors, specifically in establishing green supply alignments and dynamic power asymmetries in the supply network, the synchronisation of alliances based on their contributing resources, and the capabilities and the dependence between the alliances is assessed for synergy. This assessment is based on prior alliance experiences which involves the trust, commitment, and operational collaboration already evident, investments in internal searches and evaluations that are reinforced through the coordination of environmental collaboration, and the occupying of information rich positions in the social and economic networks. In the supply chain environmental collaboration system, this is reinforced by manufacturers and then by the associations in the industry environmental collaborations. The complementary resource endowments are further safeguarded by compatibility in organisational systems, processes and cultures (Dyer et al., 2018). In this research, the interfirm compatibility was followed when trying to understand the stages of environmental concern when developing a green culture that best synchronises efforts with collaborating partners. In the supply chain environmental collaboration, an environmental code of conduct creates a compatibility of an organisation's processes. Associations uniting the industry and then liaising with the government create compatibilities between environmental collaborations at a supply chain and industrial level.

The last relational rent is effective governance, which includes self-enforcing and third party enforcing of agreements for alliances (Dyer, 1996). The self-enforcing agreements that emerged in this study were both formally and informally based (Dyer et al., 2018). The formal self-enforcing agreements formalised environmental objectives, developed environmental codes of conduct, and included the constant environmental reporting and monitoring of environmental practices. Informal self-enforcement agreements worked through NDAs to transparently share information and trusted their partner's commitment and the communication of green knowledge. Third-party enforcements were identified as associations to facilitate and moderate industrial environmental collaboration.

The objective of effective governance is to lower the cost of relational rents, hence, informal self-enforcing safe guards are perceived to be the desired route (Dyer et al., 2018). In this research, the relational factors do facilitate informal self-enforcing governance, however the social, economic, and relational complexities of the supply network require the formal enforcement of governance in environmental collaborations through coordination. Moreover, immediate emergencies and the evolving nature of green issues constantly shifts the dynamics of relational factors (De Stefano & Montes-Sancho, 2018; Shen, 2017). Thus, transparency in sharing green resources, capabilities and authenticity in green supply alignments is needed to demonstrate the genuine commitment of partners in a collaboration and to remove those who are not as committed. However, informal self-enforcement methods require a longer time to instigate, and if supply networks were to aspire to self-enforcing governance methods, as industrial environmental collaboration cannot be achieved in a short period of time. As a result, third party enforcements such as associations play a critical role in facilitating the effective governance needed to create industrial environmental collaboration in a shorter period in response to the emergencies within green issues.

To conclude, relational rents need continuous development to create a higher performing environmental collaboration. Hence, as further supported by a relational view, relational rents are dynamic in nature and could decline over time as a result of low resource interdependence (Dyer et al., 2018). This is because the green orientation, relational factors and supply chain environmental collaboration needs to be refined, and development should always be considered as a rare, non-substitutable and valuable resource. In collaborative networks where these relational rents are not developed, collaborative partners will reduce their commitment as the economic costs are higher than the return on investment of environmentally collaborating with supply partners. Conversely, in cases when the relational rents are consistently developed and nurtured, the supply chain environmental collaboration expands further to become an industry wide environmental collaboration This increases green production scales, achieves economies of scale, and integrates governments as collaborative partners.

## 2.7 Research Gap, Questions and The Conceptual Framework

The literature has provided insights into the influence of supply chain collaboration for attaining a green, sustainable supply chain and a circular economy, the essence of "environmental collaboration" still occurs in the preliminary stages of scholarly understanding (Bouguerra et al., 2021; De Giovanni, 2011). The precursors, components and the point at which operational collaboration extends to environmental collaboration is under researched and needs further theoretical exploration (Hazen et al., 2020). Moreover, environmental collaboration is often pursued from a perspective of a "focal" company, such as a manufacturer with a supplier in the chain (Svensson, Ferro, Hogevold, Padin, & Sosa Varela, 2018). This proposes a problem as the environmental collaboration findings are bond by the resources, capabilities and power dynamics of a focal company dictating the collaborative process within a dyad or triad relationship (Wong et al., 2021). Furthermore this form of exploration from a dyad or triad perspective adopting a focal organisation's lens is not in the spirit of the "value driven" nature of collaboration and cooperation (Gölgeci et al., 2019; Tuominen, 2004). Rather, there needs to be an exchange of capabilities to attain goal-oriented objectives. Understanding the value intent of environmental collaboration through the lens of the myriad of actors involved helps in the response to the trial and error nature of the process (Kuiti et al., 2020; van Hoof & Thiell, 2014). Each partner in this network collaborates and cooperates towards the operational efficiency of the supply chain as a whole (Zhang & Meng, 2021). A good network integration is reflective of the performance of the supply chain, as each integrated partner provides a distinctive value to the competitive advantage of the chain (Tian et al., 2021). Therefore, to understand the value driven nature within this network relationship it is important to understand the undermining relational factors that underpin them.

This research therefore addresses four gaps. Firstly, a holistic understanding is needed to define the point at which operational collaboration is extended to environmental collaboration (Ahmed et al., 2020). Secondly, by exploring the precursors of environmental collaboration, this research extends the scholarly knowledge in identifying the organisations internal resources and capabilities that drives collaborative behaviour with the supply network (Trujillo-Gallego et al., 2021). Thirdly, by using a

qualitative lens to explore environmental collaboration, this research extends the existing knowledge of the components and processes of environmental collaboration in the supply network (Ren et al., 2019). Environmental collaboration has been identified as a mediator or a moderator in facilitating a green, sustainable supply chain and a circular economy (Liu et al., 2018). The qualitative and exploratory lens is needed to inductively understand the components and processes of environmental collaboration as it transpires (Ren et al., 2019). Finally, most of the existing academic knowledge has been empirically tested in an environmental collaboration in a dyad or triad relational perspective, with a focal company instigating the collaboration (Gölgeci et al., 2019). The collaboration exists in a relational network in which a myriad of relational rents exists (Srivastava et al., 2015).

Therefore, the research questions and proposition that are pursued in addressing these gaps are:

*Research Question 1: "What are the factors that create a green organisational orientation?"*

*Research Question 2: "How does green orientated organisations environmentally collaborate in the supply network?"*

*Research Question 3: "What are the relational factors assisting green organisational orientation and environmental collaboration to transpire between channel partners?"*

## 2.8 Conclusion of Chapter 2

The following chapter critically reviews the existing knowledge on environmental collaboration in the supply network. From the literature, further exploration is needed to understand the precursors and internal organisational capabilities needed to environmentally collaborate. Furthermore, environmental collaboration needs to be explored qualitatively to understand its components and processes to attain a sustainable supply chain and a circular economy. Finally, collaboration exists in a network of partnerships but is often academically explored from a dyad or triad perspective. Hence this literature explores environmental collaboration from the perspective of collaborative partners. Qualitative research methodology is used to

explore the precursors, environmental collaboration, and relational qualities in a supply network. The precursors drive the organisation's commitment to environmental collaboration, while the exploration of environmental collaboration helps identify the intersect of operational and relational activities during collaboration. Finally, the relational qualities strengthen the bonds between the precursors and environmental collaboration. The proceeding chapter 3 details the research method adopted in response to the identified research questions illustrated in the following Figure 2-1.

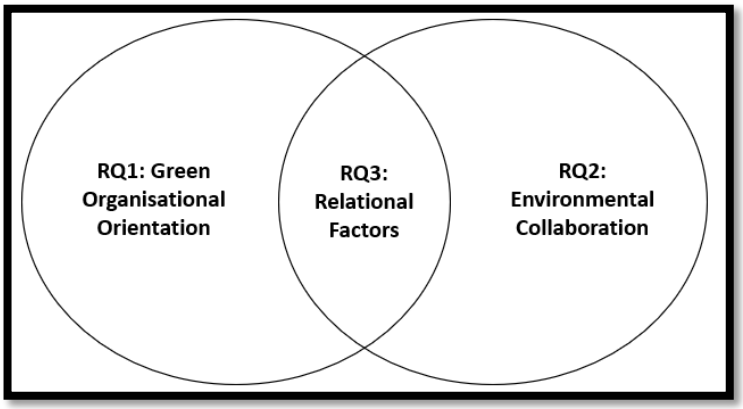


Figure 2-1: Theoretical conceptual framework of Exploring Environmental Collaboration in a Supply Network

# Chapter 3 Research Methodology

This research aims to explore four gaps. Firstly, the point at which operational collaboration extends to environmental collaboration is explored. Secondly understanding the precursors of environmental collaboration. Thirdly, the components and processes of environmental collaboration in a network, and finally the relational factors that bind the collaborative processes between partners in a supply network. In this chapter, the research approach is discussed to understand how the supply network in the furniture industry collaborates environmentally. This research uses an exploratory research lens to build a substantive theory of the precursors, components, and relational qualities of environmental collaboration. Therefore, a qualitative research method with a grounded theory methodology has been used.

## 3.1 Research Rationale and Purpose

This research addresses three gaps in the literature. Firstly, environmental collaboration has been empirically identified as a mediator in creating green, sustainable supply chains and a circular economy (Li, 2018). However, the literature calls for a qualitative exploration of environmental collaboration to understand the precursors and components of collaborative behaviour in a supply network (Trujillo-Gallego et al., 2021). Besides the response to the academic literature, it is important to explore environmental collaboration qualitatively, since in practice it occurs as an extension of an existing operational supply chain collaboration (Arora & Arora, 2020). Therefore, the exploratory lens of qualitative research is an appropriate method to understand the boundaries and parameters in which environmental collaboration occurs. Secondly, by adopting a qualitative lens the precursors that drive an organisation to environmentally collaborate emerge (Ahmed et al., 2020). Finally, the relational factors have already been explored quantitively and qualitatively from a dyad and triad relational perspective (de Almeida, 2020; Michalski et al., 2019). However, collaboration occurs at a network relational context within a myriad of organisations; hence it is important to explore environmental collaboration from a myriad relational perspective (Gölgeci et al., 2019). In this way, a qualitative research lens allows a nonlinear understanding of the relational attributes that facilitate environmental collaboration amongst supply networks.

In pursuit of addressing the literature gaps, the research questions guiding this study are:

*Research Question 1: "What are the factors that create a green organisational orientation?"*

*Research Question 2: "How does green orientated organisations environmentally collaborate in the supply network?"*

*Research Question 3: "What are the relational factors assisting green organisational orientation and environmental collaboration to transpire between channel partners?"*

To understand the precursors, components, and relational qualities of environmental collaboration, a grounded theory approach was applied. Grounded theory helps develop a substantive theory from the themes that emerge inductively from the data (Charmaz, 2001; Strauss & Corbin, 1998). The in-depth interviews are analysed inductively and thematically to empower the voices of the different channel partners during environmental collaboration. The research aims to understand how the participants experience the phenomena, the strategies they use to address the phenomena, and the causes, processes, and effects of the phenomena from the perspective of the participants. Hence, taking a qualitative and grounded theory perspective is an appropriate method in response to the theoretical building nature of the research questions.

## 3.2 Philosophical Approach

The different philosophical assumptions in a qualitative approach are ontological, epistemological, axiological, and methodology (Creswell, 2013). The philosophical approach guides the research in the direction of the objectives and goals, the articulation of the research knowledge and experience, and the evaluation criteria of the research (Creswell & Poth, 2018). This research takes pure grounded theory and an inductive approach, so all four philosophical assumptions are underpinned in this study.

Ontology focuses on the nature and characteristics of realities (Smith, 2003). Ontological philosophical assumptions embrace the existence of multiple realities, which means the existence of multiple themes of evidence and perspectives (Creswell & Poth, 2018;

Scotland, 2012). Ontological assumption is critical in the context of supply chain networks as the experiences, views and multiple realities within a chain are varied and dependent on the nature of the organisation (Grubic & Fan, 2010). In a supply chain, the realities of organisations are shared by the countries, resources, and capabilities they are exposed to. Therefore a sub-tier supplier in China might be in a collaboration with a manufacturer in Australia, but their perception of environmental issues varies as their realities are also different (Li, Wu, Goh, & Qiu, 2017). Therefore, the ontological assumption guides the research process in three ways. Firstly, the voices and realities of all channel members are heard through in-depth interviews with retailers, manufacturers, suppliers, logistics and associations. Secondly, these realities and capabilities differ between the small, medium, and large enterprises (Liao, Hu, & Shih, 2018). Therefore, organisational size was not a restrictive criterion in the unit of analysis; on the contrary, it was permissive in that it included all organisational sizes to ensure a constant comparison. Finally, the ontological assumption was further taken into consideration within the unit of analysis. For instance, an operational manager in a large enterprise with multiple international supply chain partners will have a different reality and view about the phenomena than, say, the marketing manager of the same enterprise responsible for the marketing mix of the final product (Olson, Slater, Hult, & Olson, 2018). In this research, especially in the larger enterprises, two different participants who have experienced the phenomena were interviewed to acknowledge the multiple realities that exist within a firm in terms of consistency, trustworthiness, and the authenticity of the theory generated (Amsteus, 2014). The ontological assumption taken in this research is relativism that indicates that the reality is subjective to the many interpretive realities that exist with no universal truth (Smith, 2003). A relativism ontological approach is in line with the phenomena of sustainable and collaboration explored in this research. For both these phenomena's every stakeholder in the supply chain will have their own realities of what is the truth, whilst the universal truth of what is an ideal collaboration or sustainable mechanism is yet to be scientifically resolved.

The epistemology assumption draws out subjective evidence from an individual's point of view (Scotland, 2012). It describes how known knowledge is formed through the subjective experiences of an individual (Scotland, 2012). The epistemological

assumption applied in this study is subjectivism which is the acknowledgement that the participant's knowledge is formed in the realities of their organisation's experiences when pursuing environmental issues and their knowledge are subjective in nature. It is important for the researcher to be unbiased in their own assumptions in order to create subjectivity with the participant's knowledge and realities (Tuckett, 2005).

Epistemological assumption of subjectivism was demonstrated in the research process utilizing the following two methods. Firstly, the interviews were conducted in the organisations of the participants to minimize the distance and subjectivity of the researcher with the participants (Tuckett, 2004). It was critical for this research to apply the epistemological approach of subjectivism by observing and understanding how the knowledge and realities of the participants have been shaped in the context of the participants surroundings and principles (Jonsen, Fendt, & Point, 2017). Secondly, it is important for the researcher to acknowledge their own assumptions to increase the subjectivity between participants (Creswell & Poth, 2018). To minimize the influence of the researcher's own biases and assumptions, the researcher interviewed participants from organisations that had no prior relation or contact with the researcher. This eliminated any relationship or biases that could be introduced in the responses in the interviews. This allowed for the participant's responses to be authentic and transparent, knowing the knowledge would be used for academic purposes with no repercussion from the researcher's ties to an industry or its competition (Schatz, 2012).

The axiology philosophical assumption distinguishes the value laden nature of a qualitative study (Creswell & Poth, 2018). There should be clarity in the values and objectivity of both researcher and participants as that ultimately impacts the analysis, code development, theme emergence and theory building of the research (Scotland, 2012). The elimination of the previous biases and assumptions of the researcher, does not mean no existing values and assumptions impacted the research process (Petty, Thomson, & Stew, 2012). For instance, during the screening process for the participants, some organisations made no indication on their websites or other communication platforms about any of the phenomena. This leads the researcher to assume that the organisation had not attempted any form of sustainable initiative or practice. In such a case, this assumption might lead the researcher to not interview the organisation at all.

This form of bias was eliminated in lieu placing sustainability and collaboration as the main axiological assumption of this research in the highest regard.

This research ultimately builds a theory based on the process, mechanism, procedures, and relations of the dimensions of the phenomena. Hence, organisations who did not mention any of the phenomena were not excluded as their realities, experiences, voices, and opinions about the phenomena were still valid and valued in the theory (Humble & Radina, 2019). This is especially critical in the topic of sustainability as some participants are quite vocal and active, while others prefer to internalize and not commercialize their behaviour. Hence, the researcher's own biases about how vocal or how big the effort of the participants was in relation to the phenomena were eliminated from the research process. During the code development process, the small and larger efforts were all coded and analysed inductively as it was a reflection of the value of the action by the participant (Wertz et al., 2012).

However, the assumption and biases that remained in this research were that organisations should at least be open to sustainability, whether internally or externally, with others in the supply network. During the recruitment process of participants, the researcher clearly declared that the intention of the interview was to explore their experiences in environmental collaboration. Some organisations noted they do not intend to ever involve themselves with the phenomenon, so they were no longer pursued for an interview. However, some organisations confirmed their eagerness in relation to sustainability but declared they have not yet adopted a sustainable behaviour or strategy due the challenges they faced. These organisations were still interviewed because their challenges and concerns were valuable in the pursuit of understanding the process, procedures, mechanisms, and relations of the phenomena. Ultimately, the axiological assumption embraced by the researcher included clarifying with support of consent, and the use and purpose of the interview (Creswell, Hanson, Clark Plano, & Morales, 2016). The explicit declaration of the intention of the interview as a sole purpose is to hear the participants opinions, voices, concerns and realities (Brown et al., 2018).

The methodological assumption focuses on the research process and the procedures undertaken in response to the research questions (Creswell & Poth, 2018). Ultimately,

this research developed a theory based on the inductive and thematic analysis of the participant's responses (van Griensven, Moore, & Hall, 2014). The logical progression of the research is inductive rather than entirely shaped from a theory (Fetters, Curry, & Creswell, 2013). The inductive and theory building nature of this research called for a grounded theory approach to be applied as a methodologic assumption (Strauss & Corbin, 1994). Hence, throughout the research process, the research questions and interview questions were evolving to allow for saturation of data to allow concrete, open, axial and selective coding and constant comparison to occur (Chun Tie, Birks, & Francis, 2019). The findings are reflective of a substantive grounded theory in relation to the phenomena and not generalizing to all supply chains in all industries (Bryman, Becker, & Sempik, 2008). The overarching methodological assumption was incorporated during the data collection process in three ways.

Firstly, the interview questions were open-ended in simple English for ease of understanding and interpretations. Secondly, each interview was thematically analysed before the next interview to allow the incorporation of emerging themes and a constant comparison between previous findings. Finally, the interview was semi structured, allowing the participants and the interviewer to digress or extend some of the critical points that emerged during the interview. The following section details the incorporation of the methodological assumptions used throughout this research.

### 3.2.1 Interpretive Frameworks

Imbedded in the philosophical assumption are the theoretical paradigms and perspectives that provide the theoretical lens when addressing the research problems and questions (Kemper, 2017). This research adopts a pure grounded theory and inductive and thematic analysis of the data (Braun & Clarke, 2019; Strauss & Corbin, 1994). Hence, the paradigm and beliefs expressed in the research are critical in interpreting the data, as they shape the themes that emerged and the findings and discussions in response to the research problem and the question (Goulding, 1999; Scotland, 2012). The major interpretive frameworks are post positivism, social constructivism, a transformative framework, postmodern perspective, pragmatism, feminist theories, critical theory, critical race theory, queer theory, and disabilities theories (Creswell & Poth, 2018; Petty et al., 2012).

The interpretive framework that most underpins the assumption of this research is the pragmatism approach. The pragmatism approach focuses on outcomes, actions, situations and the consequences of an inquiry (Bryant, 2009). The pragmatism perspective is outcome orientated and focuses on the best solution in response to the research problem (Fetters et al., 2013). There is freedom then to choose between philosophies and realities, as there is no absolute truth at the core of the pragmatism approach (Creswell, 2009). Moreover, pragmatism approach focuses on actional outcomes of collaboration beyond the intent, power, and socio- cultural influences of the supply chain. Hence pragmatism is the best suited interpretive lens for this research, for four reasons.

Firstly, pragmatism focuses on all dimension of the research problem, including consequences, actions, situations and solutions (Morgan, 2014). This assumption is very fitting for this research, because some sustainable realities are absolute truth, such as the scientifically proven impacts of climate change (Lincoln & Jebson, 2001). The consequences, actions, situations, and strategies used by society to combat the adverse effects of climate change is dependent on the sustainable pillars and issues dictated in each country and the capabilities and resources that are at the disposal of the organisations. Hence, the absolute truth exists that sustainable issues should be addressed how this is done is determined by situational matters that unfortunately does not result in one solution befitting all situations.

Secondly, the situational nature of these sustainable dimensions is ever evolving, hence a pragmatic approach that's view the consequences, actions and strategies are time bind is appropriate for this research. The qualitative approach and a substantive grounded theory do dictate the lack of generalization of findings as an absolute truth (Chun Tie et al., 2019). However, in the context of sustainability, a lot of knowledge is scientifically known, while a lot more is yet to be discovered and other areas are continually being improved. For instance, the accelerated and adverse effects of climate change are evident, however, what will ultimately happen is still unknown knowledge (Kjellstrom et al., 2016). Nevertheless, society is trying to provide solutions, such as alternative plastic materials or better recycling processes, which are always evolving (Trenberth, 2014). The issues faced by participants could be solved in couple of years or never solved at all.

This does not undermine their existence as a reality, but it determines the actions and strategies perceived to be the most appropriate at this time.

Thirdly, the pragmatism view focuses on “how” and “why”, which are dependent on situational factors (Creswell & Poth, 2018). This is the exact assumption of this research throughout the data collection, analysis, and findings. The generated substantive grounded theory aims to empower participant’s voices about how they respond to phenomena, why they respond in such a way, and what conditions dictate their behaviour through an inductive and thematic analysis. The theory thus generated could provide solutions and dimensions that are applicable to other supply chains but restricted to the situational, time and industry parameters of this research.

Finally, the pragmatic view dictates that absolute truth and reality may never be fully uncovered, but that responses and actions in pursuit of solving worldly problems is more critical (Bryant, 2009). This is in line with the knowledge of sustainability, which although ever evolving, may be ignored, or waiting for an absolute outcome may never happen. Hence, the major assumption in this research is that as a society we should act and respond to improving our sustainable behaviour as a journey. This journey could be an internal shift or a collaboration with others, or situationally bound but still very relevant to the reality of combating the sustainability problems at hand.

Therefore, the assumptions in this research are in line with the pragmatism view and its liberties when applying the most appropriate method in response to the research problem. In this research, the assumption is that there is a reality that is an absolute, such as climate change. It is time bound due to the evolving situational conditions and sustainability pillars. This is further affected by the resources and capabilities of organisations as dictated by the theoretical underpinnings of the natural resource based view and the relational theory (Dyer & Singh, 1998; Oliver, 1997). Hence, in practice some solutions are best resolved due to the exchange of appropriate resources with channel partners, while others are due to internal core competencies like culture (Gölgeci et al., 2019). Hence, the consequences, actions, situation, and solutions expressed are valid and appropriate in relation to the realities experienced by the participants. Yet a substantive grounded theory is essential in providing an inductive and

thematic analysis in pursuit of categorizing a probable theoretical solution to the phenomena.

## 3.3 Qualitative Research Methodology

This research adopts a qualitative research enquiry mode to explore the phenomenon of environmental collaboration in a supply chain. A qualitative approach is more appropriate when responding to the exploratory nature of the research phenomena (Merriam, 2002). This is because the objective of this research is to explore the underlying procedures, processes, mechanisms, and relations in environmental collaboration. The characteristics of qualitative research design is an ideal method in response to such an exploratory nature of the phenomena. In essence, a qualitative research method embraces a flexible and unstructured approach to explore diversity, to describe and narrate feelings, and for the perceptions of experiences that empower the voices of the participants (Hilton & Azzam, 2019) . Hence, it provides an ideal method to explore and empower the voices of the different types of organisation that make up a supply network (Hallberg, 2009).

Empowering and exploring the different types of organisations in the supply chain is critical in addressing the theoretical and managerial research problems that underpin this study. Firstly, it is evident that sustainable issues are complex and multifaceted and require a collaborative effort to understand (Dangelico & Pontrandolfo, 2015). Secondly, each type of organisation (retailer, manufacturer, supplier, logistics and association) in the supply network have different resources, capabilities and knowledge that are instrumental in exploring what leads to a collaborative behaviour (Rajaguru & Matanda, 2013). Finally, the type of collaborative behaviour varies across situations and between partners. These situations and relational attributes between partners are critical to explore, as the probable solutions and successes of collaborative behaviour is dependent on them (K. Govindan, Seuring, Zhu, & Azevedo, 2016).

The exploratory, complexity and context of the phenomena in the study yields an in-depth explanation of the “how” and “why” underpinning the procedures, processes, mechanisms, and relations of the phenomena. These characteristics befit a qualitative research method. The dimensions and probable solutions that yield a theory are

hierarchical in nature and cannot be measured or quantified in a casual hypothesis based model (Strauss & Corbin, 1994, 1998) .

### 3.3.1 Grounded Theory

The researcher used qualitative methods to explore, to empower individuals, to explain linkages, and to develop theories (Pluye & Hong, 2014; Strauss & Corbin, 1998). Hence, the research aims to explore the phenomenon of environmental collaboration to develop a theory that applies a grounded theory approach (Holton & Walsh, 2017; Savin-Baden & Major, 2013). The research uses the exploratory lens of grounded theory to empower the voices of the different stakeholders in a supply chain, explain linkages between the phenomena and to develop a theory that responds to the theoretical and managerial gaps (Fendt & Sachs, 2008).

In adopting qualitative research, five approaches exist, namely, narrative, phenomenology, ethnography, grounded theory, and case studies (Smith & Firth, 2011). Grounded theory utilizes inductive qualitative approaches to emerge theory from the data (Charmaz, 2001; Strauss & Corbin, 1998). Grounded theory extends the new knowledge that stems from a phenomenological approach to developing theories that provide systematic solutions (Goulding & Lee, 2005). These solutions reflect the actions, interactions, and processes of participants in response to social situations (Holton & Walsh, 2017). Grounded theory has progressed over the years from “traditional” to “evolving” forms There are five types of grounded theory, including classic, modified, constructivist, postmodern and discursive grounded theories (Savin-Baden & Major, 2013). The classic grounded consider full objectivity of “ all is data” including field notes, memos and literature (Savin-Baden & Major, 2013). It considers a robust inductive approach, where theory is generated from the data (Savin-Baden & Major, 2013). The modified grounded theory relies on the inductive approach of coding paradigms to conceptualize the themes (Savin-Baden & Major, 2013). The constructivist grounded theory approach acknowledged that “knowledge is mutually constructed by participants and the researcher” (Savin-Baden & Major, 2013). It acknowledges the biases and interpretations of individuals in forming their realities, rather than inductively analysing the data from an external stance, such as the classic and modified grounded theory (Savin-Baden & Major, 2013). Post-modern grounded theory focuses on mapping and

generating theory through the extension of a constructivist grounded theory of situational maps (Savin-Baden & Major, 2013). It acknowledges that positioning the theory is important, as it relies on the relations of practice, discourse, power regimes, social worlds and negotiated orders (Savin-Baden & Major, 2013). Discursive grounded theory focuses on examining the discourse and language interactions of a particular phenomenon (Savin-Baden & Major, 2013).

This research takes a substantive grounded theory stance with an in-depth objectivity in analysing the interviews. It uses inductive reasoning, open, axial, selective and constant comparison coding schemes to explore the themes and theories that have emerged from the phenomenon of the precursors, components and relational qualities of environmental collaboration (Amsteus, 2014; Charmaz, 2001). The stance of this research follows a pragmatism grounded theory proposed by Charmaz (2001) whereby the "historical, social and situational" context of the research contributes to the discovery of the themes. The categories that emerged are constructed in a substantive theory that is the interpretation of the researcher and the participants in the phenomena (Charmaz, 2001). The interviews are inductively coded and thematic and constant comparison techniques were applied (Randall, Flint, & Mello, 2012).

Grounded theory is reflective of the following criteria, which includes fit, workability, and relevance (Amsteus, 2014). Fit refers to the validity of the pattern that emerges, from which the data can be conceptualized (Corbin & Strauss, 2008). This was conducted in this research through a constant comparison of themes across the participants and other different participants within the organisation (Goulding, 2017). The proceeding sections demonstrates this process, while the themes that emerged are fully discussed in Chapters four, five and six. Workability refers to the findings when solving the participants' issues (Holton & Walsh, 2017). The findings are projected in a conceptual framework dictating the developed theory and its reflection of procedures, processes, mechanisms and the dimensions of the explored phenomena (Holton & Walsh, 2017) . Relevance refers to the significance of the phenomena in terms of theoretical and managerial implications (Holton & Walsh, 2017). Supply chain collaboration has been the centre of the supply chain literature for decades (Ahmed et al., 2020) . The pressures of climate change and UN sustainable development goals has brought environmental

collaboration to the forefront of discussion, both theoretically and managerially (Govindan et al., 2019). Hence, the phenomenon of environmental collaboration is a significant and relevant issue that needs an exploratory investigation (Dangelico & Pontrandolfo, 2015).

### 3.3.2 Research Method

Qualitative research gives a meaning and voice to concepts in an organic manner in their natural settings (Creswell & Poth, 2018). It is a holistic narrative and description to understand the phenomenon (Amsteus, 2014). There are eight attributes of a rigorous qualitative research design, which have been applied to this research (Roberts, Dowell, & Nie, 2019).

The first attribute is the interpretation of the "phenomena" under exploration, which has to be clear to both the interviewer and the participants (Sandelowski, 2000). The phenomenon under exploration in this research is environmental collaboration. To collect rigorous data from the right participants who understood the phenomenon, a two-step verification screening process was undertaken.

Before contacting and approaching any of the organisations in the furniture industry, secondary research was undertaken which included the organisation's website, product catalogues, reports, social media accounts and news bulletins. This gave the researcher insight into the organisation's activities with respect to the phenomena (Ray & Sharma, 2020). The screening process also helped in determining the organisations' size and scale, which alluded to the industries and markets it contributes in. This aided the interviewer's judgement and insight into the organisation's potential knowledge and experience about the phenomena (Amsteus, 2014).

However, it is important to mention that organisations who did not mention any of the phenomena were not explicitly excluded. This is because the definition of green and sustainability are multifaceted, and involves small steps such as internal recycling, as well as bigger steps, like green manufacturing. Excluding an organisation based on their small efforts in sustainability doesn't mean they are not open to or supportive of becoming more sustainable in the future. Organisations who did not mention in the first screening process any form of sustainable or green initiatives through their channel

medium were still approached. The participants who accepted the interview despite their few efforts about the phenomena expressed their concerns, the challenges and their future aspirations instead (Palinkas et al., 2015). The second step in the "interpretation of phenomena" was further validated when the transcriptions of the interview were sent to participants for further clarification and confirmation. At this stage, the participants had had the opportunity to modify any of their responses. The two-step verification process aided in the congruency of the interpretations of the phenomena, for both the interviewer and the participants (Palinkas et al., 2015).

The second attribute of the qualitative research design is the influence of the researcher's views, experiences, values, biases and motivation throughout the research process (Sundler, Lindberg, Nilsson, & Palmér, 2019). The pragmatism approach, from which the overarching assumption of this research was derived, was mentioned previously. However, the researcher's personal biases were applied to the research process using these three steps.

In the first step, the participants received a detailed information sheet about the purpose and objectives of the research. The participants were thoroughly informed about their anonymity and the safety measures of their identities and information provided (Schreier, Stamann, Janssen, Dahl, & Whittal, 2019). In the second step, before happened before the interview began, the researcher explicitly reiterated her experience, the purpose, and the objectives of the interview questions for the research. The interviewer also created a rapport and a confidence with the participants 'stance on the matter by declaring the participants will and choice to respond to questions fully, partially or they could disregard them (Holton & Walsh, 2017). Finally, the third step allowed the participants to review the transcription of their interview. the participants had the opportunity to modify their responses by removing any misinterpretation the researcher might have made during the analysis of the transcripts. These steps allowed the interpretation of the underlying values, biases, and expectations of the research to be openly discussed with participants.

The third attribute of qualitative research design is applying the correct research method to the sensitivity of the phenomena under exploration (Annells, 2006). This was applied in three ways. Firstly, the exploratory nature of phenomena and the

empowering the of voices of the participants can be qualitatively evaluated using interviews, documents, observations and audio-visual materials (Creswell et al., 2016) . Interviews can be further divided between one to one interviews and focus groups (Fakis, Hilliam, Stoneley, & Townend, 2013). This research adopted an in-depth one to one interview that took between 30 minutes and 2 hours 45 minutes. The reason one to one interview was preferred was due to the interview questions that were asked. The interview questions cantered around resources, capabilities, and the knowledge of participants in relation to the phenomena between their supply chain partners (Appendix H). Such information may not be perceived as secret or readily traceable in public reports; however, the underlying motivations and strategies could be classified as a competitive advantage that participants might not feel comfortable discussing in front of competitors or partners in a focus group. Furthermore, one to one interview allowed for an in depth and semi structured exploration of the participants responses, which lead to strengthened findings. Secondly, interviewing participants in their organisations allowed for their comfort in a natural setting that impacted their ease in responding to the interview questions. Thirdly, to further the participant's ease they were assured that their responses, identity, and organisation's name would remain anonymous throughout this research. This made the participants more comfortable, so they were more open when responding to the interview questions.

The fourth attribute of qualitative research design is the use of multiple methods to deconstruct complex patterns (Humble & Radina, 2019). Using multiple methods is important for the realities to be free of personal bias or emotions during the interview. In this research, the methods used included the screening of an organisation's public information, websites and communication channels, followed by a confirmation of the phenomena under exploration during the recruitment stage of the data collection (Abeysekera, 2014). Rigour during the data analysis stage was expressed through open coding, axial coding, selective coding, constant comparison and thematic analysis in order to substantiate the themes that emerged as authentic and reflective of their categories (Braun et al., 2019). This will be explained in depth in the proceeding sections.

The fifth attribute of qualitative research design is its exploratory nature, as it uses deductive, inductive and abductive reasoning to empower the voices of the participants

in relation to the phenomena (Thomas, 2016). This research aims to generate a theory in response to the different dimensions, procedures, processes, mechanisms, and relations of the phenomena. Thus a pure inductive reasoning technique was applied during the data analysis in this research (Braun & Clarke, 2019). As the research adopts a grounded theory approach, the inductive reasoning involves open coding, axial coding, and selective coding to inform the themes that emerged. This is demonstrated in the proceeding sections (Charmaz, 2001; Chun Tie et al., 2019).

The sixth attribute of qualitative research design includes using the natural settings of the participants for comfort, ease, and rapport (Trotter, 2012). This was closely observed in this research when all the interviews were taken in the participants' office or organisation (Alam, 2005). Unfortunately, part of the data collection phase happened after the Covid-19 pandemic in New Zealand (Refli Simbolon & Setyo Riyanto, 2020). Hence, eight of the interviews were done using online platforms, including Microsoft Teams, Zoom or phone calls (Schatz, 2012). In these cases, the researcher conducted the interviews in a professional setting but unfortunately not in the natural setting (face to face) of the participants (Schatz, 2012). This was to adhere to the social distancing rules set out by New Zealand government during the pandemic.

The seventh attribute of qualitative research design includes amending the interview questions to accommodate the emerging new patterns and themes that are generated from the data collection by conducting semi-structured interviews (Hannabuss, 1996; Vaismoradi, Turunen, & Bondas, 2013). For instance, although some of the main interview questions were cemented throughout all the interviews, the other prompt questions consisted of themes and patterns that emerged in previous interviews and these were constantly compared (Buetow, 2010). Additionally, to confirm the responses of the larger organisations with other organisations, two different participants were interviewed from within the same organisation (Amsteus, 2014; Appleton, 1995). This was to clarify the consistency of the themes and realities at an inter-organisational level (Amsteus, 2014; Appleton, 1995).

Finally, the eighth attribute of qualitative research design is acknowledging that the findings of the research are an holistic account of ever-changing and complex situations (Ishtiaq, 2019). This research focuses on the organisations in the furniture industry in

the Oceania region. The research acknowledges that some of the predictive solutions stemming from the themes could be restrictive to developing countries in terms of culture, governance, governmental and economically conditions (Roberts et al., 2019).

### 3.3.3 Research Quality

The quality of research can be assured by evaluating its "truth" value, trustworthiness, authenticity, goodness, relevance, rigour, and plausibility (Savin-Baden & Major, 2013). The "truth" value acknowledges that the ultimate "reality" may be imperfectly understood by the findings of this research (Trotter, 2012). The overarching assumption of this research is that sustainable issues are valid and are occurring beyond the knowledge construction of the participants. Although the generated theory is reflective of the participant's knowledge to attempt to combat sustainable issues, it is implausible to declare that all sustainable issues are solved in this manner.

The trustworthiness of the research process was ensured by the "objectivity" of the researcher and by constant reflexivity throughout the research process (Nowell, Norris, White, & Moules, 2017). This is in accordance with the imperfection of the "truth" value in sustainable issues beyond the findings of this research. The theory that was generated is applicable to the bias interpretation of the participant's and their realities. Also, this theory was generated under the overarching assumption that sustainable issues need to be addressed and hence the findings underpin mechanism, dimension, process, and procedures in potentially solving such issues. However, to moderate preconceived biasness and relational influences, the researcher had no personal or professional relationship with the participants or their organisations before the study. Hence, throughout the research process, from recruitment, selection, analysis and interpretation, the objectivity of the findings are reflective of the realities of the participants and not the biases of the researcher (Nowell et al., 2017).

The authenticity of the research is defined by acknowledging that the findings of the research are subject to the participant's socially and experientially developed interpretation of the phenomena (Dockrell, 2004). In this research, a participant who is categorized as a large enterprise with an abundance of resources will experience the phenomena very differently when compared to a smaller enterprise participant with

selective resources to spare for sustainability. Hence, to demonstrate the authenticity in the findings, the participants all represented different parts of a supply chain and were varied in terms of their characteristics, such as being a small or large enterprise, being privately or publicly owned and their role in sustainability. Also, by interviewing the larger organisations twice, the authenticity of the realities within an organisation were assessed. By interviewing different types of participants in different roles, and on separate occasions, it allowed for an in depth understanding of the realities to be explored across the value chain.

The goodness of the research is defined as the influence of social, economic, and political ethics, and the cultural values of the participant's assumptions with regard to knowledge and reality (Nowell et al., 2017). Hence, to demonstrate a goodness fit, the sampling criteria involved the commonalities among potential participants. For instance, the participants had to be in the furniture industry in Oceania thus creating a united perception of environmental issues within a common social and economic context. The commonality of cultural values across the participants also removed the significance of personal cultural values in shaping their perceptions of sustainability and behaviour. The political influences also allowed for a common perception of government roles and policies in relation to environmental collaboration for the participants (Forman, Creswell, Damschroder, Kowalski, & Krein, 2008).

The relevance of any research is defined as the emphasis and importance of the findings of the research (Amsteus, 2014) . The phenomena explored in this research are in pursuit of generating a theory that could solve sustainability issues as a collaborative effort. Sustainability is a multi-faceted subject, with three distinctly different pillars and multiple dimensions. The complexity of sustainability calls for collaborative support and behaviour. Hence, this research aimed to respond in terms of understanding the dimensions, processes, procedures, and the mechanisms that underpin a green organisational orientation, environmental collaboration, and relational attributes. At its core, a green organisational orientation refers to the precursors that are bound to an organisation's resources and capabilities, to an environmental collaboration with the supply network. Environmental collaboration emerged as more than just a supply chain issue, rather an industrial level collaboration that results in an increase in green

production and economies of scale that influences other people to also collaborate. Relational factors strengthen the collaborative process throughout the supply network and an industry.

Rigour in the research process is required to demonstrate that the findings of the research are authentic and relevant to the participants' realities, while exhausting the most appropriate methods in response to the research questions (Appleton, 1995). This research aimed, in the first instance, to generate a theory that explored the phenomena. Hence, open coding, axial coding, selective coding, and thematic analysis were inductively used to interpret the data (Chun Tie et al., 2019). The participants were selected based on theoretical sampling and the assumption that they were open to solving sustainability issues (Holton & Walsh, 2017). To understand the realities across the value chain, retailers, manufacturers, suppliers, logistic staff, and associations were interviewed. Each category had varied attributes to capture all types of participants, regardless of size, scale, and capabilities. They all collaborated to demonstrate the reality of environmental collaboration in a supply network. To assess the consistency of realities within an organisation, some larger participants were interviewed twice from two different strategic roles about sustainability. Finally, by engaging with participants and with a review of the transcripts (and later the managerial reports of the findings), the researcher's ability to demonstrate an accurate interpretation of the participant's voice aided in the demonstration of the rigour through the research process, through which authentic themes emerged.

Plausibility in the research process recognizes that the knowledge is co-created with the participants and the researcher (Bryant & Charmaz, 2007). This was demonstrated by this researcher in two stages. In the first stage, once the interview was transcribed the transcript was sent to the participants to modify, approve, or reject any of their responses. This assured the accuracy of interpretation and the context of the participants' realities from the verbal to the verbatim structure (Schreier et al., 2019). The participants' approvals were received before any data analysis commenced. In the second stage, after the data analysis of all the transcripts was finished, a managerial report was given to participants as a sign of gratitude for their participation in the

research. However, this was also used as a plausibility interaction to seek their feedback and plausible alternations to the findings of the research to reflect their realities.

Therefore, by evaluating the "truth" value, trustworthiness, authenticity, goodness, relevance and rigour, the plausibility of the research processes four quality strategies were adopted, namely experience over time, triangulation, an audit trail and member checking (Holton & Walsh, 2017). To demonstrate that the realities are relevant across time, the participant organisations who were interviewed twice for consistency were purposefully interviewed at the beginning and the end of the data collection period, which commenced in October 2019 and finished in January 2021. This time difference aided in the researcher's understanding of the evolving nature of the realities or their resilience across time. This was critical, especially as in December 2019 to November 2020 the global pandemic of Covid-19 surged in Oceania. Some potential participants immediately declined any more engagement with the research, stating that "sustainable issues are no longer paramount compared to economic imperatives". Other participants interviewed in relation to the pandemic noted that "they have used this opportunity to extend their sustainable initiatives to address social issues throughout the value chain".

A triangulation strategy was used to rigorously explore the phenomena from multiple perspectives (Smith & Firth, 2011). In the first instance, triangulation was used in the theorization of the phenomena. This research is underpinned by two theories, namely a natural resource-based view and a relational view. A natural resourced based view demonstrates that to achieve a competitive advantage while being aware of environmental concerns and pollution prevention, product stewardship and sustainable development are possible outcomes. The relational view demonstrates that an organisation's resources, capabilities, knowledge, and governance bind the nature, type, and outcome of collaborative behaviour to their partners. These underlying theoretical assumptions were paired with an exploration of the phenomena to provide a theoretical grounding for the generated theory. In the second instance, during data collection triangulation was used to collect data from documents, participants, and the cross comparison of themes. This allowed for rigour in the interviews and in the sampling strategy of the research. In the third instance, triangulation strategy was used to analyse the data, including feedback from the participants in response to the transcripts,

inductive analysis, axial coding, selective coding, cross comparisons, and thematic analysis. This was then followed by the participant's feedback to allow for the accuracy of the findings in representing the participants voices.

Audit trial strategy ensured an orderly bookkeeping and the organisation of all the documents across the research process (Savin-Baden & Major, 2013). In this research the transcripts, analyses and findings had be orderly numbered and saved across multiple versions and sources to preserve each step in the research process. The multiple and updated versions of new files ensured any past changes were not overwritten completely in case the researcher wanted to reinstate previous analyses and documents. The saving of the documents in multiple hard disks ensured the safety of the documents in case one source failed.

Finally, member checking involves the co-creation and confirmation of participants in the findings of the research (Savin-Baden & Major, 2013). The core attribute of qualitative research is to reflect the voices of the participants. Hence, member checking throughout the research process gives accuracy, credibility, and authenticity to the findings of the research. This was done in this research in two stages. Firstly, once the interviews were transcribed, the script was sent out to the participants for confirmation. Before the final approval of the script from the participants, the researcher did not analyse any of the interviews. Secondly, once the analysis was finished and findings were comprehensive, a managerial report was conducted. This managerial report was sent out to the participants for feedback. The following table illustrates the steps taken in this research to ensure research quality and rigour throughout the data collection, analysis, and confirmation process.

| Trustworthiness Criteria | Method Addressed in this Research |
|---|---|
| Credibility: Results representing the data | • Concurrently analysing and data collecting until theoretical saturation reached<br>• Two independent researchers coded the data and discussed the gaps in their interpretations.<br>• The results were shared with participants to understand their interpretations were accurately projected |
| Transferability: the findings can be replicated in other contexts | • From each organisation 2 individual participant was interviewed to understand the assumptions were consistent in the organisation<br>• The CEO, Marketing and Supply chain management roles were interviewed to understand consistency across interpretations of realities<br>• Organisations from various scale, size and property was interviewed to understand the breadth and depth of each phenomenon from multiple perspectives |
| Dependability: findings are unique and consistent in terms of time, place, and context. | • cross comparison between similar organisation types such as retailers.<br>• Cross comparison amongst similar roles in different organisation types<br>• Cross comparison amongst collaborating partners in a value chain.<br>• Organisations that were not as proactive in their green marketing were still interviewed to understand their hesitancy and challenges. |
| Confirmability: eliminating researchers biases | • Both coders had no prior experience in supply chains.<br>• Both coders had no formal and informal acquaintance with any of the participants.<br>• Both coders reviewing the transcripts independently<br>• The results were reviewed with participants to confirm the findings reflected their accumulated interpretation of the phenomenon |
| Integrity: eliminating misinformation in the interpretations | • Ethical approval received for non-evasive questions.<br>• The participants and their organisations were anonymous<br>• The transcriptions were reviewed by participants after the interview to confirm their accuracy<br>• Local jargons and abbreviated terms were reconfirmed by the participants for explanation.<br>• The interview was conducted in participants organisations for comfort were possible. |
| Fit: findings fit with substantive areas of investigation | • The three methods of cross comparison of the data elevated the aggregated themes and categories emerged.<br>• The conceptual framework was reviewed by an expert panel of theoretical and managerial experts. |
| Understanding: findings are true representations of participants realities | • Participants reviewed the transcribes before analysis<br>• Participants reviewed the initial axial coding of the data<br>• Participants reviewed the final conceptual framework that emerged |
| Generality: findings represent multiple perspectives of the phenomenon | • Multiple roles in a same organisation were interviewed to understand the different perspective of the phenomenon in each organisation<br>• Similar roles and organisation types were independently and dependently cross comparison to identify multiple realities of the phenomenon<br>• Expert panel that reviewed the final conceptual framework were from marketing, relationship marketing and supply chain discipline that provided insights based on their own expertise. |
| Control: participants influence on theory | • The participants were from multiple roles with above 3 years' experience in that discipline<br>• The expert panel that reviewed the conceptual framework were doctorates from multiple discipline |

Table 3:1:Trustworthiness of Data

### 3.3.4 Interview Questions and Process

The literature does allude to the fact that for a supply chain to be completely green or to adopt a circular economy as a competitive advantage, the inter-organisational resources, capabilities, knowledge and governance are critical (Hong, Zhang, & Ding, 2018). Therefore, the interview questions that were used were inspired by the academic literature (Deterding & Waters, 2018). The questions underpinned by the knowledge in the literature acted as prompts to inspire an exploration and interpretation of open ended question by the participants (Dworkin, 2012). The semi-structured nature of the interview allowed for digression and for follow up questions to be asked, depending on a participant's response (Deterding & Waters, 2018). The following is the list of questions asked during the interview:

1. Please explain your role, responsibility and how long have you been in this position?
2. Could you please explain about your environmental collaboration with supply network partners?
3. Could you please explain about your environmental collaboration with customers?
4. What has been the role of government during the environmental collaboration?
5. What has been your personal role during environmental collaboration?
6. What has been the role of your organisation during environmental collaboration?
7. What has been the role of partners during the environmental collaboration?
8. What has been your challenges during this process? How did you overcome them?
9. What did you need from your partners during the environmental collaboration?
10. What kind of information did you share with your supply chain partners regarding environmental practices?
11. What are the resources or capabilities you needed to implement an effective environmental collaboration?
12. How did you align your partners for collaboration? Did you forgo any previous alignments?
13. How did you manage the alignments in the supply network for collaboration?
14. What are the benefits and costs you have had to become more sustainable?
15. What do you think is the steps towards organisations on becoming more sustainable?
16. Do you have any recommendations of other individuals/organisations that I should speak to?

The interviews conducted were semi-structured, from 30 minutes to 2.45 hours long. A semi-structured interview was preferred due to the knowledge of the phenomena being explored (Crouch & McKenzie, 2016). For instance, there is a lot of knowledge about collaboration in the supply chain for economic imperatives; however, sustainable or environmental imperatives are yet to be explored qualitatively (Niesten et al., 2017).

Conducting the interviews in a semi-structured manner allowed for further digression and for the interview questions to evolve and adapt, relative to the participant's responses, experiences and knowledge (Gubrium & Holstein, 2001).

All the interviews were audio recorded, using a voice recording device for transcription and data analysis purposes (Devries, Kelly, & Storm, 2010). A total of 21 interviews were conducted and transcribed, of which 13 interviews were transcribed by the primary researcher of this paper, and eight of which were sent out to a transcriber due to time limitations. The interviews that ranged 30 or so minutes produced eight pages, while the interviews that were two hours 45 mins long produced 30 pages of transcriptions. Ultimately, the total number of pages transcribed for 21 interviews was 735 pages on A4 paper. The process of transcription involved the researcher and a transcriber. The first 13 interviews were transcribed by the researcher to allow for data familiarity and a closeness that lead to a deeper understanding of the concepts emerging from the data (Bazeley, 2009). The interviews transcribed by the researcher were on a software named Express Scribe Transcription Software. The audio of the interview was uploaded into this software, and the speech was reduced to a slower speed while the researcher transcribed the interview using Microsoft word. By transcribing the first 13 interviews, the researcher gained the benefit of understanding the underlying motivations and responses of the participants. This also gave the researcher an insight into new themes emerging, which needed to be clarified and cross compared with other interviews. The eight interviews transcribed by a transcriber were cross checked by the researcher by listening to the audio recording and re reading the already transcribed interview. This allowed for familiarity of data to be gained as well as assuring accuracy.

The ultimate accuracy check of all the scripts was done in two ways. Firstly, once the transcription was done the researcher rechecked it at normal speed and re-read the transcription. Secondly, the transcriptions were sent out to the respective participants for further review and approval. At this stage, a few outcomes developed as most of the participants did not change anything and confirmed the transcription. Of the 21 participants, two requested further changes, which were both minor changes. These minor changes involved changes in spellings the names of individuals and organisations and changes to product specific names, such as indigenes timbers and other supplies

that had been wrongly interpreted due to accents and discipline specific knowledge. This reassured the accuracy of the transcription and interpretation of the assumptions before data analysis was undertaken and gave the data collection stage of the research validity, comparison, rigour, and credibility (Roberts et al., 2019).

### 3.3.5 Participants and the Sampling Strategy

The participants described their role, responsibilities, and experiences within the organisation in relation to each phenomenon. The unit of analysis was the organisation's type, which was categorized into retailers, manufacturers, suppliers, logistics and the associations that make up a supply chain. The sampling strategy of a grounded theory study has to be theoretical as the sample will inform the generated theory; hence the sampling strategy is based on a non-probability sampling (Creswell & Poth, 2018). Grounded theory research calls for a theoretical sampling that is homogenous and heterogenous in nature (Corbin & Strauss, 2008). The homogenous sampling included an expert sampling technique where potential organisations who have had experience with the phenomena were contacted. This allowed for the different dimensions of the phenomena to emerged. The heterogenous sampling including the snowball sampling technique, where different size, scales and roles of the organisations were interviewed to confirm the dimensions and categories emerged within the theory (Strauss & Corbin, 1998). This aided the researcher to explore the "why", "how" and "what" elements of the phenomena (Manuj, Flint, & Pohlen, 2012).

An expert sampling technique was conducted by searching for retailers, manufacturers, suppliers, logistic and association organisations in relation to the furniture and hardwood industry in Oceanian (Forman et al., 2008). The results included 65 retailers, 23 manufacturers, 18 suppliers and nine logistic and five associations. To find the right participants in relation to the phenomena, a two-step verification process was undertaken. Firstly, the documents that were explored included an organisation's website, the information on their websites, product catalogues, reports, social media accounts and news bulletins. This was done to make sure the potential participants had experience with the phenomena and to extract their contact details. The potential participants were contacted via email with a detailed information sheet attached. A copy of this email and the information sheet is available in Appendix D and Appendix E

respectively. Secondly, during the contact phase with the potential participants, the objective of the research with the attached information sheet was explained. During this step, most participants noted they were not at all open to any form of sustainable initiatives. Because of this, they did not satisfy the overarching philosophical assumption of this research and were excluded from it. When the participants noted their interest, an interview was conducted. Snowball sampling took place after each interview by requesting the participants to introduce other organisations within their value chain for an interview. Ultimately, the sample size of this research is N= 21, which includes six retailers, four manufacturers, four suppliers, four in logistics and three associations. According to Charmaz (2001), in grounded theory the appropriate sample size for saturation and theoretical sampling is between 20 and 30. Hence, the sample size of this research supports the grounded and theoretical sampling method.

The choice of sampling strategy was constrained by considerations such as the accessibility of the participants, the researcher's judgment of a participant's ability to have the required expertise, and the different or common shared experiences of participants with the phenomena (Palinkas et al., 2015). Firstly, all organisations needed to be involved directly with the furniture industry. For instance, the steel and metal companies that were interviewed supplied products for outdoor furniture. Hence, their involvement in construction was not considered appropriate. This assumption was to create a boundary or parameter for the research within one industry structure as a common denominator for participants (Amsteus, 2014).

Secondly, the organisations interviewed varied in size and scale. This allowed for the generalizability of findings across the supply chain and industry to be made. Hence, it was critical to interview large scale organisations who had an abundance of resources, versus the smaller organisations who experienced more challenges and barriers (Groh-Samberg & Tucci, 2010). Therefore, the theory generated is not conditioned for a specific type of organisation with a certain number of resources at their disposal. To comply with this assumption for each supply chain partner, both small and large-scale organisations were interviewed.

Thirdly, it was critical to question the different and shared experiences of the participants with the phenomena. This allowed the researcher to explore the spectrum

of “realities” present with regards to the phenomena of precursors, components and the relational qualities of environmental collaboration (Crowe & Sheppard, 2011). Therefore, potential participant organisations who did not mention any green or sustainable initiatives in the document screening and the initial contact phase were still interviewed. This shed light on the obstacles, challenges and concerns they have experienced regarding the phenomenon (Knafl et al., 2007). This allowed for the researcher’s understanding of the potential participant’s assumptions and expectations in relation to the phenomena during the interview process as well. This research did not create strict parameters in terms of contacting organisations who explicitly brand themselves as green or sustainable, because there is no hard rule in the literature or in the industry regarding what is 100% green or sustainable (Cleveland, Kalamas, & Laroche, 2005). Also, the research wanted to explore the “true realities” of the phenomena experienced by the organisations, which included their concerns, challenges, solutions, and future objectives (Groff, 2004). These sampling criteria and conditions determined the depth and breadth of the information collected (Gentles et al., 2015). Hence the participants provided an “information-rich” aspect towards the phenomena (Tuckett, 2004).

Fourthly, the assumption was that the organisations had to at least have some level of openness and eagerness towards sustainability regardless of their capabilities. All the participants had a positive intention to be more sustainable either currently, or soon. During the first contact some organisations expressed very vividly their lack of interest into ever pursuing any sustainable or green initiatives. In such an instance, the researcher found an opportunity to explore the challenges and concerns the organisation felt about sustainable or green initiatives. They explicitly mentioned they do not believe in climate change or in the need for sustainable initiatives. Hence, such organisations were not at all interviewed.

Fifthly, the accessibility of participants in this research was based on their presence in Oceania. Since the research aimed to capture “the true realities and experiences of participants” not based on their scale and size (Palinkas et al., 2015). This assumption helped to create common geographical and economic conditions for the organisations as a common denominator in addressing environmental issues. The organisation’s

presence in Oceania was the primary criterion for sampling. In terms of accessing the organisation, first an invitation email with an attached information sheet was emailed out to potential participants. Second, once a potential participant was interested, an arrangement was made for the interviewer to conduct the interview in the participant's office. However, online arrangements were made during the Covid-19 pandemic to satisfy the safety, health and social distancing measures set out by the Australian and New Zealand governments. Finally, because this study adopted a pragmatism approach to generate a theory, the constant comparison of findings was critical. During this process, often the participants noted that "associations play a critical role in bringing the industry together for a collaborative effort in environment collaboration". Because of this, the associations were contacted and became part of the target sample. Traditionally, associations are not classified as supply chain partners, but this study needed to explore the dimensions of environmental collaboration in its entirety. Hence, the associations were interviewed too.

The participants that were interviewed as a representative of their organisation varied in their role depending on the organisation's structure and scale. For example, in some of the small-scale organisations, the CEO oversaw all green and sustainable initiatives. Hence the ideal participants were the CEOs, who were interviewed. This was also the case in the associations because the managing director or CEO in the association had the overall strategic role in the association's activities within the industry. The second role of some of the participants was as sustainability officer or supply chain officer involved sustainable activities. Such participants where the ideal candidates for this research as they made the sustainable strategies within the organisation's supply chains. The third role that was interviewed were marketing officers. Marketing officers were approached for two reasons. Firstly, the bigger organisation's sustainable and supply chain officers often noted they had no control over the marketing and communicating of any of the phenomena to the wider customer base. They mentioned that as much as they had control and strategic level decision making in the sustainable initiatives in backward integration, they had no control over the marketing communication, channel mediums and advertising of green initiatives in the forward integration of the value chain. Hence, in the bigger organisations the marketing manager was also interviewed to be able to gain a clearer assumption and outcome of the organisation's experience with the

phenomena. Secondly, by interviewing some organisations twice on two separate occasions with two separate roles, the rigour and consistency of realities and assumptions within the firm was assessed. It was critical to make sure the experiences and assumptions of the analysis of one representative organisation was not biased to according to an individual's lived experiences. The large organisations had above 50 employees whilst the small to medium sized enterprises had at least 10 to 50 employees. Table 3.2 illustrates the final participants interviewed in each category and their attributes.

| **Organisation Type** | **Person Interviewed** | **Role of participants** | **Experience (years)** | **Size of organisation** |
|---|---|---|---|---|
| **Retailers (N=6)** | Isabella | Sustainability Developer | 30 | Large |
| | William | Chief Sustainable Officer | 10 | Large |
| | Warren | Sustainable Manager | 5 | Large |
| | Brianna | CEO and Marketing Manager | 20 | Large |
| | Sebastian | CEO | 5 | Medium |
| | Milo | CEO | 8 | Small |
| **Manufacturers (N= 4)** | Robert | Sustainable Manager | 10 | Large |
| | Francis and Farhan | CEO and Marketing Manager | 10 | Large |
| | Edward | Business manager | 15 | Medium |
| | Khloe | Sales and Marketing Manager | 5 | Medium |
| **Suppliers (N=4)** | Frank | Carbon and Environmental performance Manager | 15 | Large |
| | Elijah | Marketing and Innovation Manager | 10 | Large |
| | Marco | CEO and Marketing Manager | 30 | Medium |
| | Robin | Product Designer and Sourcing Manager | 10 | Large |
| **Logistics (N=4)** | Dominic | Health, safety, and environmental Officer | 10 | Large |
| | Mikhail | Head of Business Development team | 5 | Large |
| | Kyra | General Manager of Product and Marketing | 5 | Large |
| | Garret | Trade and Industrial Sales Manager | 7 | Large |
| | Dominic | Health, safety, and environmental Officer | 10 | Large |
| **Associations (N=3)** | Bruno | CEO | 10 | Large |
| | Francesca | CEO | 8 | Medium |
| | Nathan | CEO | 5 | Medium |

Table 3:2: Summary of Participants

### 3.3.6 Coding and Thematic Analysis

The objective of this research was to generate a theory, hence inductive reasoning and thematic analysis were instrumental (Boyatzis, 1998). This research's objective is to generate a theory, hence inductive reasoning is used to inform the concepts and themes

that emerged in the data (Fereday & Muir-Cochrane, 2006). Thematic analysis extends the inductive approach to draw patterns between the concepts and themes that emerged in order to generate categories (Braun & Clarke, 2006).

The themes should be flexible and variable to understand the underlying philosophical assumption of the phenomena that show rigour, reasonability, validity and the comprehensiveness of the built theory (Sundler et al., 2019). The themes that emerge should adequately represent all aspects of the phenomena while representing all participants (Vaismoradi et al., 2013). Other explanations of the phenomena must be considered together with the negative cases. These themes should incorporate the respondent's implicit, explicit and emotional perspective of the phenomena (Spiers & Riley, 2018). The phenomenon under investigation in this research is environmental collaboration, which is multi-faceted and requires an in-depth analysis of latent and manifest codes. To do this, the six steps of analytical strategy were used, including an immersion in the data, memoing, reflexivity, open coding, axial coding and selective coding (Boyatzis, 1998; Braun & Clarke, 2006). It is worth mentioning that each stage overlaps and often reflection and a revisiting of each stage is part of an inductive, thematic analysis when generating a theory.

Firstly, immersion in the data was a critical step that called for the rereading of the transcripts, not just for accuracy but also for comprehension and understanding purposes (Braun & Clarke, 2006). Familiarization with the data results in understanding and reliving the interview from a third person's perspective (Braun & Clarke, 2019). This results an in depth understanding of how the information and data evolves (Roberts et al., 2019). During this transformation, the concepts that allude to their significance or multi layered nature might be repeated and reiterated. In this research, this step was undertaken by rereading each transcript at least four times.

The first round involved just rereading the transcript while listening to the audio for accuracy purposes. This line by line reading of the transcript assured that either the researcher or transcriber correctly transcribed the interview in the first instance. In the second round, the researcher reread the script while listening to the audio to better understand the underlying emotions and context of the responses. This was to understand and note any interesting emotion or context that could change the meaning

of the words and scripts. For instance, when asked about the government's role in encouraging environmental initiatives within the industry many participants often nonverbally rolled their eyes or frowned while verbally and sarcastically saying "yeah sure". Although the phrase "yeah sure" alone might note a positive answer, within the context and tone of the response it has a negative annotation. Similar phrases were read with the audio and marked and noted within the script manually.

The third round involved rereading the transcripts to note and memo certain information and phrases that were interesting, curious, needed to be explored and a were a preliminary theme. This third round of familiarization with the data aimed to summarize the key points expressed in each script. The fourth round of familiarization was when the scripts were uploaded onto NVivo 12 software for analysis (Houghton et al., 2017). During this time the researcher redid the memoing exercise electronically to reflect any new information or concept emerging from the data that was missed in the third round. The third and fourth rounds were purposely done in two separate days to allow for the researcher's mental clarity when concentrating on the data and to not impose biases or rush the process and miss concepts due to tiredness (Boyatzis, 1998). It is worth mentioning that for some extended and more complex scripts some of these rounds were done more than once.

Secondly, after familiarization with the data was done, memoing commenced (Braun & Clarke, 2006). Although the initial phases of the memoing overlapped with previous steps, memoing at this stage was much more orderly. During this stage, which overlaps with the reflexivity step, the researcher took note of the mood and perceptions influencing the memoing step. At this stage it was important to note the difference between the memoing in the third and fourth round of familiarization with the data. For instance, in some cases little phrases were missed in the third round of memoing because overarching concepts were memoed. For instance, some participants noted "they were lucky to have a leader who supports their green initiatives". In the third round of memoing this was noted as "the role of leadership in response to green initiatives". However, in this stage of memoing, some cross comparison occurred between manual and electronic memoing in the third and fourth round in different instances. When comparing other memos across the other scripts it was noted that "the

feeling of being lucky" occurred with other participants as well. It was noted that although the participants and their organisations were open to sustainability, encouraging green and sustainable innovation and behaviour operationally at an organisational culture level is often overlooked. This was not interpreted in the third round of memoing by the researcher, but through the reflexivity of the biases and assumptions noted by the researcher, it was noticed in the fourth round and in the memoing second step orderly.

Thirdly, the reflexivity step included reflecting on the researcher's interpretive assumptions, which influenced the research process (Braun & Clarke, 2006). The overarching assumption of this research is that the participants must be open to sustainable solutions in accordance with the reality that sustainable issues are valid and real. However, although the participants expressed their overarching intentions and constructive views on solving sustainable issues, this assumption was not reflected in all concepts that emerged. For instance, government and global collaboration was presumed nearly impossible to ever happen, while governance and industrial and association collaboration were assumed to be a more practical and potential an opportunity. Hence, during the data analysis the overarching assumption was not evident all throughout the inductive and thematic analysis of the findings.

Fourthly, the open coding process was done in two stages. In the first stage, the scripts were open coded manually. In the second stage, the scripts were coded electronically in NVivo 12. The reason for this distinction was to compare both techniques and note any differences in the reflexivity, assumptions and process that might influence the outcome (Strauss & Corbin, 1998). The codes that were missed out in either stage was analysed again to see whether they were insignificant, modified or part of a bigger theme. For instance, in the manual open coding stage, concerns about the environment and "organisational culture" were noted that expressed the level of concern employees had about the environment and how this influenced the organisational culture to be receptive to environmentally collaboration. In the electronic open coding, the code was grouped under forming a green organisation. This comparison alluded to the significance of using NVivo to code in a convenient and efficient manner that influences the outcome of the research (Houghton et al., 2017). In this step, 630 open codes emerged.

Fifthly, the axial coding step is an overlapping extension of the open coding stage and is done in two stages. In the first stage, which overlaps with the later part of the open coding stage, the codes were grouped together in accordance with the similarity of attributes and meanings (Kendall, 1999). For instance, the codes "leader's exposure to green issues" and "hiring [of] green conscious employees" are both reflective of the role of green leadership in the organisation. Hence, both codes were grouped as green conscious leadership.

Searching, reviewing, and grouping the open codes into themes and subthemes is part of the first stage of axial coding step (Rowlands, 2005). In the second stage, the grouped themes and subthemes are further reviewed to find patterns, meaning, casual conditions, intervening and context, strategies, and consequences (Walker & Myrick, 2006). In pursuit of understanding the latent meanings of the proposed themes and subthemes, further groupings resulted in capturing the in depth, hierarchical and core attributes of the concepts emerging. For instance, besides environmental concerns and a green organisational culture, the organisational structure as a subtheme emerged as a significant facilitator in adopting green issues. Therefore, the theme forming a green organisation was supported by green organisational restructuring, understanding the stages of environmental concern, and developing a green culture. During the axial coding process, the 630 open codes were grouped to form 11 themes and 27 subthemes.

The sixth and final stage of thematic analysis is selective coding. Selective coding involves further refinement of the themes to understand the core concept, value and attributes shared by the themes (Walker & Myrick, 2006). At this stage, each theme is described and defined, and the underlying story and proposition that emerges are grouped in themes under a category (Scott, 2004). In this research, three distinct categories emerged, including green organisational orientation, environmental collaboration, and relational factors. Green organisational orientation is defined as the activities the firm adopts in addressing environmental issues. These are the precursors that drive the organisation towards environmental collaboration. The supporting themes that emerged were green conscious leadership, forming a green organisation, and assessing plausible green practices. The environmental collaboration category was supported by supply chain and industrial environmental collaboration. The supply chain

environmental collaboration theme was supported through restricting the supply network, coordinating environmental collaboration, and defining partner roles. The industrial environmental collaboration theme was supported by a competitor's environmental cooperation and the association's role. Finally, the relational factors category was supported by the six relational themes of establishing green supply alignments, dynamic power asymmetries in the supply network, trust in green supply alignments, communication in a green supply network, transparency in sharing green resources and capabilities and authenticity in green supply alignments.

## 3.4 Ethical Considerations

Ethical consideration must be applied in relation to three stakeholders, namely, the participants, the researcher, and the funding body (Roberts et al., 2019). In terms of ethical consideration of the participants, ethical issues in the collecting information, the seeking of informed consent, expressing gratitude, seeking sensitive information, and the possible harm for participants, as well as confidentiality were considered (Tuckett, 2004). In this research process, two signed copies of the consent form were distributed to each participant. One signed consent form was given to the researcher for record keeping and the permission to audio record, transcribe and analyse the responses in the interview. The second copy of the consent form was kept by the participants for record keeping purposes (Appendix F).

In the online interviews, the consent form was emailed to the participants before the interview and was received back before the commencement of the interview. In seeking informed consent from the participants, the information sheet was shared with them on two occasions. As the first point of contact via email was the information sheet it was provided for their perusal. As the second point of contact prior to the commencement of the interview, the information sheet provided by the researcher was explained. As an expression of gratitude for the participant's time and effort in participating, they were provided with the transcript of the interview, and later a managerial report detailing the findings of the study for them to use as they wish.

The sensitivity of information in this research included names and descriptions that could be used to identify the participant organisations and the participants identity

(Savin-Baden & Major, 2013). Throughout the research, the names of organisations and participants was anonymous. The only identifier is a broad description, such as a private or publicly owned company, their supply chain role (retailer, manufacturer, supplier, logistic or association), and a brief description of their experience with the phenomena. During the interviews, some participants recognized supply chain partners or individuals in their responses. Such identifiers were also considered as sensitive information as they could be used to trace the identity of the participants or the participant organisations. It is worth mentioning that as the transcription of the interview was sent to the participants for review, they had another opportunity to modify any other information they deemed sensitive. Finally, to maintain the confidentiality of the participant's data, the transcripts and responses were saved in a locked drawer under the supervision of the researcher, while the electronic version was also saved on encrypted files on a hard disk. The names and identifies presented throughout the research have all been constructed to protect the confidentially of the participant organisations, the participants, the information, and the responses.

Ethical issues from the perspective of the researcher can arise in the research process. These include biases, the misuse of an inappropriate methodology and incorrect reporting (Crowe & Sheppard, 2011). To avoid biases and incorrect reporting that could influence the interpretation of the findings, the researcher requested the participant's confirmation of the transcription of the interview and the findings of the research. This allowed for a participant's full disclosure as to how the information provided was presented and reported. In this research, none of the participants noted a misinterpretation of the information in any of the two phases. The appropriateness of the methodology was guided by the supervisory and advisory team of the researcher, who have an abundance of experience in qualitative and grounded theory research. Their experience and overview on the research process provided the researcher with the ability to conduct the research rigours. The research was also presented and confirmed by the Graduate Research School of Auckland University of Technology. Any fundamental or methodological issues were amended and rectified according to the committee's assessment of the proposal. The Ethical committee also reviewed and confirmed the appropriateness of the methodology in terms of interview questions, sampling criteria and data collection procedures. This can be found in Appendix G.

## 3.5 Conclusion of Chapter 3

This chapter discussed in detail the research design of the research. In summary, a qualitative and grounded theory approach underpins the exploration of environmental collaboration in a supply network. The substantive theory that emerged was through an inductive, thematic, and cross comparison analysis of the open codes, and selective and axial codes that emerged from the data. Theoretical saturation was achieved at a sample size that included 21 retailers, manufacturers, suppliers, logistics employees and associations, which together make up the furniture industry in Oceania. The participants were collaborating on environmental issues to demonstrate the "reality" of environmental collaboration in the supply network. The three categories that emerged were green organisational orientation, environmental collaboration, and relational factors. Each category will be discussed in Chapters Four, Five and Six respectively.

# Chapter 4 Findings of Green Organisational Orientation

This chapter explores the thematic findings of the precursors of environmental collaboration (Braun & Clarke, 2019). There has been an increasing pressure from governments, communities, and customers for organisations to take responsibility for their environmental impact by pursuing green issues (Govindan et al., 2019). Some activities are well within the means of organisations, while others are very challenging and require a joint effort between partners. The research question that guided the exploration of this phenomenon is:

"What are the factors that create a green organisational orientation?"

A green organisational orientation is defined as the activities the firm adopts in addressing environmental issues. Organisations addressing green issues must be resilient and committed to investing in a problem that is continuously evolving and may not have an economic return (Mohajeri & Fallah, 2014). Therefore, organisations assess the opportunity costs of every green issue that has publicity (Sharma et al., 2020). Concurrently, they also assess the significant investment into resources, capabilities and the knowledge needed to understand green issues (Vaccaro, 2006). Applying a grounded theory and the thematic analysis technique, three overarching themes emerged as factors in green organisational orientation (Braun & Clarke, 2019; Charmaz, 2001). These include green conscious leadership, forming a green organisation, and assessing plausible green practices. The Figure 4.1 visualises the themes and sub-themes explored in support of green organisational orientation category:


Figure 4-1: Thematic Findings of Green Organisational Orientation

## 4.1 Green Conscious Leadership

Green conscious leadership is defined as a leader that addresses green issues in their decision making. Leaders can be top or middle managers in an organisation that makes a strategic or tactical decision to pursue green issues. A green conscious leader is anyone in the organisation that has a managerial role in leading the organisation towards pursuing green issues (Dubey, Gunasekaran, & Samar Ali, 2015). Depending on the size and scale of the organisation, the leadership team can consist of a number of managers or just a CEO (Abdullah & Keshminder, 2020). Larger organisations tended to relegate the responsibility of green orientation to specific managers, while this role was pursued by CEOs in smaller firms (Defee, Lindgreen, Esper, & Mollenkopf, 2009). Nevertheless, leaders emerged as an instrumental factor in driving an organisation towards addressing green issues. The sub-themes that support the theme of green conscious leadership include a leader's personal green consciousness and their role in pursuing green orientation. A leader's personal green consciousness is defined as their personal beliefs and awareness of green issues when making decisions. The exposure and experience of leaders to environmental issues shapes their beliefs and awareness of being environmentally responsible as a manager. The second sub-theme is the role of green conscious leaders, who defined their responsibilities as a green conscious leader. Various roles emerged as distinctive in a green conscious leader in pursuit of a green orientation in the organisation. Green conscious leadership arose as the most significant

factor in setting the tone, the striving, and the development of the organisation to pursue green issues. Table 4.1 summarises the key codes that support the theme of green conscious leadership.

| Theme | Sub-Theme | Key Codes |
|---|---|---|
| Theme 4.1. Green Conscious Leadership | 4.1.1. Leader's Personal Green Consciousness | • Leader's exposure to green issues<br>• Leaders' genuine commitment in addressing green issues |
| | 4.1.2. Role of Green Conscious Leaders | • Investigating validity of green solutions<br>• Making decisions based on multiple disciplines<br>• Persuading stakeholders to adopt green consciousness<br>• Empowering stakeholders to pursue personalised green issues<br>• Hiring green conscious employees<br>• Retaining green conscious employees |

Table 4:1: Key Codes of Green Conscious Leadership

### 4.1.1 Leader's Personal Green Consciousness

The leaders and top managers of the organisations were responsible in driving green orientation. However, participants reiterated that the leader's genuine intent is more important than their strategic role in implementing green orientation. Hence a leader's personal green consciousness is defined as their belief and awareness in addressing green issues in their decision making. Participants reflected that a leader's genuine intent in driving the implementation of a greener orientation is reflective of their personal green consciousness. Francis was the CEO of a commercial furnishing manufacturer in New Zealand, while his colleague Farhan was the marketing manager. They both reflected that pursuing green issues in the organisation was driven by the two of them. They also reflected that their personal beliefs shaped their green consciousness and encouraged them to pursue green issues in their corporate roles. However, their employees were also more receptive to implementing the green changes because of Francis and Farhan's genuine commitment to green issues.

> *"It starts with leadership, starts at the top. We must show the team that we are genuinely committed to the environment. We both grew up in Whangarei and we wanted to preserve the beauty."- **Francis and Farhan, Manufacturer, CEO & Marketing Manager***

Robert was the sustainable manager of a company manufacturing commercial furniture in New Zealand. He reflected on his transformation when becoming a green conscious leader. Robert reflected that he hadn't been conscious of green issues earlier, however

after his studying for Bachelor's in New Zealand he had the opportunity to live in China for five years. In China he was exposed to numerous types of pollution, the most impactful being air pollution. Robert's exposure to significant air pollution resulted in him becoming more appreciative of New Zealand's air quality and therefore more conscious of environmental issues. His current role is largely influenced by his experience and an appreciative attitude towards preserving the nature of New Zealand. Robert's green consciousness and its influence on his managerial role encouraged his CEO to appoint him as a sustainable manager, with the resources and authority to drive green orientation throughout the organisation.

Mikhail was a head of business development and pursued sustainable initiatives in the New Zealand branch of his global logistic organisation. He admired the genuine commitment the CEO showed in addressing green issues in the organisation. Mikhail reiterated that the CEO overtly demonstrated his green consciousness both personally and professionally. Personally, he drove electric vehicles, while professionally, he would make sure the recycling bins were sorted accordingly, even if it meant he had to go through the bins himself. Mikhail felt the CEO's genuine intent in driving green orientation set the tone for a green consciousness throughout the organisation. In this way he made the employees feel supported and committed to the environmental issues that had been set in the organisation.

Elijah, as Marketing and Innovation Manager for his steel organisation, reflected that his green consciousness stemmed from his childhood. He noted that when he was growing up with his grandfather, they cleaned the beaches during their afternoon walks. Pursuing green issues came as second nature for him. Although his role wasn't defined as the sustainable manager, he always pursued green issues in his role. Although Elijah's comments resonated with the idea that personal green consciousness influences green leadership, he reiterated that being a green leader should be the norm. He believed that a sense of responsibility should be the norm and that CEOs should be held accountable for the environmental consequences of their organisation's operations

> *"I grew up taking buckets and cleaning the beach every afternoon during my walks with my grandfather. Being environmentally conscious is second nature to*

*me, I always choose the solutions that are greener. But we all must be responsible, if some don't want to, then stop doing business get out, it should be the norm."- **Elijah, Supplier, Marketing & Innovation Manager***

In conclusion, participants reflected that their personal green consciousness does influence the commitment of leaders towards a green orientation. The personal green consciousness stems from various sources, such as childhood upbringing, geographical influences, or exposure to environmental issues. However, drawing from their personal green consciousness, participants reflected that they have become more committed to green issues in their corporate roles. Middle managers who have observed this from their senior managers felt the leaders have set the tone for green orientation through their genuine commitment to addressing green issues.

### 4.1.2 Role of Green Conscious Leaders

In the preceding sub-theme, it became evident that a leader's personal green consciousness influenced their commitment to addressing green issues in their organisation. The influence of green conscious leaders is mostly determined by their role in the organisation. The role of green conscious leaders is multifaceted and is defined as the responsibilities a leader has in pursuing green issues in the organisation. Elijah reiterated that green issues are multifaceted and evolving, therefore the choice of a green solution is not uniform. As a Marketing and Innovation Manager, Elijah believes it is important to investigative all the plausible opportunities that arise as a possibility for a green solution. He draws his knowledge from various disciplines, including environmental sciences, management, marketing, and other research, so he can combat the multifaceted nature of green issues. Elijah's responsibility was to introduce green solutions into his organisation, which then bears significant costs and needs further investments. Hence, Mikhail had to be investigative when researching the credibility of a plausible green solution. Therefore, he often proactively pursued advice from various stakeholders to bridge any knowledge gap he had experienced in assessing the effectiveness of the green solution.

*"My role involves marketing, innovation manager, sustainability, and strategy. A good 40% of my job is pursuing R&D projects for new product development and*

*services that are sustainable. Trying to make the right decision based on limited knowledge is another challenge. I must make sure any solution I bring to my senior managers is credible.", -* ***Elijah, Supplier, Marketing & Innovation Manager***

Francis and Farhan echo the sentiments about being conscious when green investigative issues were proposed to them. In the preliminary step, when addressing green issues, Farhan, the CEO, spent time learning through a variety of sources about plausible solutions they could apply to their manufacturing organisation. They had to be investigative to ensure the plausible green solutions were credible, and for the betterment of the environment.

Robert reflected that, as a sustainable manager, he is responsible in driving the momentum of green orientation throughout the organisation. He reflected on the idea that persuading others to become green conscious has been a significant part of his role. Robert noted that employees have become more aware than managers about the green issues, which every role is confronted with. Robert's role is to persuade and encourage his colleagues to become more environmentally conscious. He reflected that leader cannot be the sole drivers of green orientation, and that the commitment of internal stakeholders is instrumental in sustaining the pace of green orientation.

*"In terms of the leadership, we're all on the same page and most businesses are as well. There are still certain little hurdles to persuade everyone but now from the top down everyone's got this in mind and then we can gain momentum." –* ***Robert, Manufacturer, Sustainable Manager***

Edward, the business manager of his manufacturing organisation, faced two distinct challenges when persuading his organisations towards the adoption of a green practise. Edward first reflected on the fact that that the furniture industry is a mature industry; many internal stakeholders have been in the furniture business for a long time. The stakeholders have in this time gained knowledge and experience, which has served them economically. Hence, Edward's sentiments in persuading his shareholders to invest in green orientation was challenged considerably by the shareholders, as they did not want to risk their rewards by implementing new ways of working. Edwards's sentiments for a

green orientation were also met with a mix of generational points of view. Edward reflected that as the shareholders are all elderly, their response to green issues is a dismissive mindset. His younger employees did not need convincing and were immediately persuaded to make the necessary changes in their roles so they could work towards a green practice.

Comparing the sentiments of persuasion, from Robert and Edward it is evident that the role of green conscious leaders is as effective as the response of the internal stakeholder when being adaptive in addressing green issues. Therefore, other participants tried to hire or retain employees who were already green conscious, rather than spending time persuading others. Garret studied this approach and noted that his organisation's liaisons with universities in hiring interns is very successful in they later identifying green conscious interns for permanent employment. Garret said that employee who are personally green conscious are already driven to implement a green orientation. Hence, his choice of management hiring and their retention while cultivating a green consciousness among employees is part of the role a green conscious leader to sustain the momentum of green orientation.

Edward and Garret alluded to the fact that younger generations tend to be more drawn to green consciousness than their elders. Robert predicted that the momentum of green orientation will accelerate in the next five to 10 years. He also noted that younger generations are consciously more environmentally driven. The role of green conscious leaderships will become the norm when they achieve managerial roles in the future

> *"Once our generation get into true leadership positions, i.e., CEOs and boards, that that might change because we already see that there's a shift from young people wanting to do things differently. So certainly, maybe another five or 10 years, once my generation are running businesses, we might see bigger change.",*
> - ***Robert, Manufacturer, Sustainable Manager***

In conclusion, green conscious leaders set the tone for a green orientation in an organisation. To do this, they must investigative the credibility of green solutions, seek multidisciplinary knowledge in addressing green issues, persuade internal stakeholders to adopt a green orientation, and hire and cultivate green conscious employees. The

younger generation has also emerged as more willing to adopt a green orientation and have been recognised as the future of making green conscious leadership the norm.

## 4.2 Forming a Green Organisation

The second theme that emerged was around forming a green organisation, which is defined as an organisation that pursues green issues. Participants reiterated that once their leader's initiate green orientation, the internal stakeholders must be involved in this change. The participants formed an organisation that facilitates the adoption of green orientation. Three sub-themes emerged: firstly, green organisational restructuring, understanding the stage of environmental concerns, and developing a green culture. Green organisational restructuring reforms the business model and the hierarchical structure of an organisation, so they can be responsive when addressing green issues. Secondly, understanding the stages of environmental concerns is defined as assessing an internal stakeholder's stages of concern when addressing green issues.

it is important to restructure the organisation to be responsive to green issues (Aboelmaged & Hashem, 2019). To sustain the momentum of green orientation, a flat or decentralised hierarchical approach facilitates the adoption of green issues. Employees can then decide about the green issues they face in their roles without the continuous monitoring of green conscious leaders. When investigating the stages of environmental concerns is important to assess an employee's genuine intent in adopting a green orientation. If the majority of the employees don't believe in the significance of addressing green issues, then organisations will experience friction in its transition to green orientation (Kumar, Meena, & Difrancesco, 2021). Therefore, addressing green issues that employees believe in pursuing is critical (Amrutha & Geetha, 2021). The momentum of a green orientation should not be pursued by key employees or leaders only. Rather, a green culture should be developed to cultivate and sustain green orientation as an entity within the organisation (Luu, 2018). Table 4.2. summarises the key codes that support forming a green organisation.

| Theme | Sub-Theme | Key Codes |
|---|---|---|
| Theme 4.2. Forming a Green Organisation | 4.2.1. Green Organisational Restructuring | • Lack of autonomy due to franchise business model<br>• Adopting a decentralised approach to address regional green issues<br>• Adopting a matrix structure to facilitate knowledge sharing<br>• Creating independent business units to purse personalised green issues. |
| | 4.2.2. Understanding the stages of Environmental Concerns | • Disregarding green issues<br>• Comforting to minimum effort in pursuing green issues.<br>• Reactionary to market demand<br>• Proactively pursuing green issues ahead of demand<br>• Green centricity in all decision making<br>• Collaboratively pursuing green issues |
| | 4.2.3. Developing a green culture | • Conducting Environmental Training<br>• Cultivating green innovation through competitions.<br>• Focusing on outcome vs scale of green issue<br>• Personalising the green issues for employees<br>• Pursuing green issues valuable for employees |

Table 4:2: Key Codes of Forming a Green Organisation

### 4.2.1 Green Organisational Restructuring

Green organisational restructuring is defined as reforming the business model and the hierarchical structure of an organisation to make things adaptive in pursuing green issues. The structure of the organisation facilitates the adoption of a green orientation in the firm (Aboelmaged & Hashem, 2019). The business model, size, scale, and hierarchical decision making makes up the structure of the organisation (Vaccaro, 2006). The adoption and momentum of green orientation is largely influenced by the organisations' structures (Fernando & Saththasivam, 2017).

Brianna's organisation was a great example of a business model not facilitating the adoption of green orientation. Brianna shed light on the fact that as a franchising retailer, any new initiatives or objectives were outlined by the master franchisor. Therefore, as a regional manager of her store she could only address the green issues that are in her control at an operational store level; for example, setting up recycling bins and recycling mattress packaging. Brianna reflected that since the business model is a franchise format, the autonomy of strategic decision making in terms of green orientation at a corporate scale resides with the master franchisors.

Comparatively, Mikhail's organisation, which is a globally renowned freight firm, specialises in green transportation. Due to their global presence, they felt responsible when addressing green issues in all regions. However, their scale also provided them with the resources, capabilities, and a wide range of opportunities to invest in green issues. Hence, Mikhail's firm has adopted a decentralised structure, despite their global scale, which has allowed the headquarters to set overarching objectives that include several environmental issues. By taking a decentralised approach, each region has the autonomy to adapt the objectives in accordance with regional concerns and regulations. Taking a decentralised structure also helps increase the autonomy of decision making for each independent regional branch. Decentralised decision making empowers the regional business units to address green issues that are critical or impactful on their regional needs.

> *"We operate internationally, but the decision-making is localised, so it sits with those regions. They decide how best to respond to local regulations. They decide what standards they want to meet, beat, or go to next. We've got quite a bottom-up approach to some of this.", -* ***Mikhail, Logistics, Head of Business Development Team***

Elijah's firm is a large-scale steel supplier in Oceania, and he reiterated that the overarching frameworks policies, and standards were developed within a centralised structure. But the decision making need a decentralised approach with significant coordination throughout all business units. The business units are dispersed throughout multiple industries, including construction, manufacturing, and furniture. Elijah's furniture supply unit had the freedom to pursue the green issues that impact the furniture industry, while using the resources and capabilities that are unique to their business unit. As a result of a decentralised and independent approach in the structure of the organisation, Elijah felt empowered to address green issues that are challenges within his specific industry and that could make a huge difference.

Warren's organisation is a large-scale firm that strives to be New Zealand's leading sustainable retailer. To achieve this, Warren's CEO completely restructured its organisation from a centralised hierarchical model to a decentralised matrix structure. The matrix structure involved splitting the many departments in the organisation into

multi-functional teams. The team were made up of cross-disciplinary roles that collaborated on various projects. By creating a matrix structure, the decision making became decentralised and each multi-functional team could then work on different green issues. Since the teams where multi-functional, various disciplines could then target a green issue that helped contribute to cultivating green knowledge. Moreover, the teams had full autonomy in investing in the green issues that mattered to them. Warren was the sustainability manager, who helped guide the green objectives of each team. He reiterated that compared to other structure, the matrix structure empowers everyone to address green issues within their roles. The restructuring has increased the momentum of green orientation, as all the internal stakeholders are actively involved in the process.

> *"Our Group CEO he gave us the autonomy or freedom that tell us – Do whatever you want, we will behind your back, because this is at the end of the day a top-down approach, and our members are very passionate about what we are doing. it is a very good system matrix formatted structure that helps us operate in an agile format. There is a lot of initiatives I can support that I know I have the support of the CEO. And it motivated everyone to reflect on the sustainable issues we can accomplish within our role.", -* ***Warren, Retailer, Sustainable Manager***

To conclude, organisational structures facilitate the adoption of a green orientation. Organisations that have a global presence have more opportunities, more resources, and the capabilities to invest in addressing green issues. Retrospectively, however, they also had a bigger environmental footprint than some others. This proposed more responsibility on them to pursue green issues. The most popular structures were decentralised and matrix that empowered internal stakeholders to have the autonomy in addressing green issues that had the biggest impact for them. The decentralised approach allows organisations to adapt their green issues to regional needs in accordance with regional regulations.

### 4.2.2 Understanding the Stages of Environmental Concerns

Understanding the stages of environmental concerns is defined as assessing the internal stakeholder's stages around their concern regarding green issues. Participants

reiterated that the momentum of a green orientation in the organisation is dependent on the receptiveness of the internal stakeholders. By understanding the stages of environmental concern, the employee's progression of commitment to green issue can be moderated accordingly.

The first stage of environmental concern is disregarding. Dominic highlighted that some internal stakeholders have a lack of concern about adopting a green orientation. The plausible causes of this disregarding of the issues included not believing in climate change or the feeling of "helplessness" in the face of mounting environmental issues. He explained that carbon emissions in New Zealand is less than 0.2% of the global total, hence some employees felt helpless about making a change. Disregarding stakeholders reiterated that even if all the organisations in New Zealand adopted a green orientation, the outcome would not be impactful when compared to the acceleration of climate change. Dominic reflected that persuading disregarding employees included dialogues focusing on the impacts rather than measuring the outcome. Organisations faced with many stakeholders who disregarding environmental concerns should address green issues that are easy to attain with a tangible outcome that empowers the leaders to demonstrate the significance of every small contribution. For example, tracking the waste of the organisation over time helps demonstrate the difference one initiative can make in reducing waste.

Comforting is the second stage of environmental concern that internal stakeholders may demonstrate. The comforting stage of environmental concern focuses on pursuing the minimum required changes when addressing green issues, without making a significant investment. Comforting stakeholders want to demonstrate their concern through minimum effort to feel consciously comfortable that they are not complacent. Brianna demonstrated comforting environmental concern as she invested in addressing green issues that were within the means of her resources, capabilities, and control. These included having a recycling option in the organisation or recycling the plastic mattress covers from customers. Brianna didn't proactively pursue green issues with the master franchisor. For employees who have comforting environmental concerns, targeting green issues that are impactful, but cost saving is more effective. At a comforting level,

the employees engaged in minimum efforts for gratification purposes rather than investing heavily in challenging the status quo.

> *"But what I can do is recycle plastic in my own stores. We often collect back the plastic bags the mattress comes in from the customers. This was initiated by us not the head office. I don't think I can do more than this anyway.,"*- ***Brianna, Retailer, CEO & Marketing Manager***

In the third stage of environmental concerns participants were reactionary. Edward said that his organisation only started addressing green issues due to the rising market demand for green products. Due to their reactionary responses, Edward didn't invest considerably in researching the best alternative green solutions available to them. Rather they relied on certifications, schemes, and frameworks to guide them in their green orientation. Since Edward had a reactionary mindset towards green issues, he strongly considered the trade-offs and risks associated with green solutions. As an example, Edward produced some green furniture with the accreditation of the FSC. However, since Edward's actions were in response to market demand, he was particularly interested in understanding his customers' perceptions of accreditation on packaging. Reactionary environmental concerns require addressing green issues consciously to protect the reputation of the organisation from customers' negative perceptions. Therefore, addressing green issues that could be authentically communicated to engage with customers' responses is a good route towards green orientation. For example, using certifications on packaging can easily convey the environmental impact intended by the organisation.

Proactive environmental thinking is the fourth stage of concern, as expressed by Elijah. His organisation outlined a roadmap that forecast green objectives for the next five years. Elijah stated that his organisation aimed to become a leader in the industry, hence they had started addressing various green issues. Since Elijah's proactive concerns required him to be a step ahead of the market and of industry trends, his organisation invested considerably in innovation, R&D and cultivating green knowledge. As a proactive environmental concern, Elijah strategically investigated the environmental impact of all his operations throughout the organisation. Sustaining the momentum of

green orientation is paramount, hence training all internal stakeholders to strive towards addressing green issues is considerably important.

> *"Over the last 3 to 4 years we have been really interrogating our products and partners in understanding to what that carbon loading is. We are very proactive in our approach because we want to be a leader in this space.", -* ***Elijah, Supplier, Marketing & Innovation Manager.***

The fifth stage of environmental concern is green centricity, whereby internal stakeholders consider green issues to be at the forefront of their decision making. The significant difference between green centric stakeholders with proactive environmental concerns was that the stakeholders did not need to be persuaded and influence of green conscious leaders. Rather, green centric stakeholders were very overt and independent in pursuing green solutions in their specific roles. Here, the role of green conscious leaders became more influential in terms of providing support, empowering, and rewarding green centricity. Robin reflected that his internal stakeholders were green centric, hence green issues were at the centre of their decision making and it had become second nature to them. Robin reflected that his main role is to ensure they have enough resources and support to cultivate their green centric attitude. Another approach he used to ensure green centricity was to cultivate and encourage by incorporating green objectives into his employee's contracts. This approach helped sustain green centricity in the organisation while allowing for the outcomes to be recognised and rewarded accordingly. Employees felt their behaviour was appreciated and hence green centricity was further nurtured throughout the organisation.

However, Robin also reflected that customisation and adaptability are important attributes to consider when implementing green objectives in employee contracts as green issues are always evolving and the process of pursuing solutions for them is influenced by many factors beyond just the commitment of the employees. Hence, the point is to reward the green centricity of employees rather than being negative if they don't achieve it. Therefore, in cases where the green objectives had not been met the reward reflects the employee's commitment, learning and the knowledge acquired in trying to actively pursue green issues, despite many challenges. Robin's approach motivated stakeholders to pursue green orientation as a norm in their roles.

*"It was very surprising the moment we formalised the intent in the contracts, the employees felt appreciated and rewarded. The mindset shifted and we all worked towards the strategic objectives however we individualised the goals and set the expectations based on the role and duration of contract. It was not a bonus exercise anymore it was purposeful and rewarded accordingly.", -* ***Robin, Supplier, Product Designer & Sourcing Manager***

The final stage of environmental concern is collaborative, wherein internal stakeholders advocated for green centricity with external partners. Collaborative environmental stakeholders became advocates for green issues when dealing with external stakeholders. William's stakeholders were overtly collaborative on their campaign media channels, and in procurement, customer engagement, internal operations and so on. William noted that internally they created policies to ensure all their product categories are scaled in terms of measuring their environmental performance. This scale was then shared among each multi-functional team which they were encouraged to share with external stakeholders at each trading opportunity. The intention was to motivate external stakeholders to also become green orientated. Cultivating a collaborative environmental concern is however largely dependent on the alignments, types of relationships and the targeted green issues that exist in the partnership. Hence, to cultivate a collaborative concern, William analysed all their partnerships throughout the organisation in terms of the green issues they could collaborate on. He focused on mutually beneficial green issues that encouraged external stakeholders to also pursue a green orientation.

In conclusion, participants reflected that despite the influence and role of green conscious leaders, the pace at which green orientation is adopted in the organisation is dependent on the internal stakeholder's receptiveness. Therefore, part of forming a green organisation is understanding the stages of environmental concern that exists in the organisation among internal stakeholders. The six stages of environmental concern that emerged were disregarding, comforting, proactive, reactionary, green centric and collaborative. Through various methods participants were able to transition between the stages and cultivate a green attitude among internal stakeholders to pursue a green orientation.

### 4.2.3 Developing a Green Culture

Considering the participant's sentiments in understanding the types of environmental concerns among internal stakeholders, it is evident that sustaining a green orientation requires developing a green culture. Developing a green culture is defined as creating a culture that sustains addressing green issues over time rather than relying heavily on the influence of green conscious leaders and highly concerned internal stakeholders (Hong, Guo, Chen, & Li, 2020). Considering that the participants reflected on the various stages of environmental concern that resided in the organisation their approach to developing a green culture was also varied.

Mikhail's organisation formed their green culture through conducting environmental trainings, inductions, and regional competitions. The purpose of the competitions was to ensure a practical application of the training and to then share green knowledge across different business units. The outcome of the competitions resulted in newly developed products or services that were environmentally friendly. Mikhail remarked that this approach helps when encouraging the internal stakeholders to be creative and innovative in addressing green issues in their roles.

> *"We do have formal induction processes, so week-long trainings. They do their licensing and understanding of the sustainable targets. We have friendly little competitions against other rival branches to come up with some green innovation. It is good practice to make sure everyone is applying their trainings and then sharing that knowledge across the organisation.", -* ***Mikhail, Logistics, Head of Business Development Team***

Robert noted that different departments in the organisation have a variety of reasons for addressing green issues. Hence, when developing a green culture that is sustainable over time it is important to align the department's objectives with the outcomes of the green issue. For example, the Accounting Department's objective is to reduce the costs in an organisation, hence assigning green issues that are cost and waste reducing is very motivating for them to pursue. Comparatively, the Marketing Department prefer s addressing green issues that could easily be promoted to customers to attain some branding benefit. Human resource departments seek social issues that centre around

giving back to the community and the internal stakeholders wellbeing. Therefore, Robert thought that an ideal green culture is when the outcomes of the green issues are well aligned with the objectives of the department. This alignment helps motivate internal stakeholders to pursue the green issue and achieve an outcome that is significant to them. This approach also empowers the internal stakeholders in being part of the ethos of green orientation.

Elijah agreed that aligning the sentiments of green issues with the concerns of the employees helps the adoption of green culture internally. Elijah realised that an employee's personal culture also influenced their receptiveness to addressing green issues. He agreed that the personalisation of green issues helps develop a wider acceptance of the ethos of green orientation. For example, Elijah noticed that his New Zealand employees tended to be more consciously aware of green issues, due to the 100% Pure Campaign that was launched in New Zealand in 1999 for tourism purposes. The campaign resonated considerably with the branding of New Zealand being pure and clean, reflective of a green perception. Therefore, Elijah felt that Kiwi employees adopted the green culture more easily than others as they understood the difference it made to the ecological environment in New Zealand.

> *"Look there is a concept of clean, green New Zealand which is driven into people it is hardwired into our DNA with the 100% pure campaign. That naturally makes it easier for us to start such conversations cause we all want to make a difference in New Zealand."- **Elijah, Supplier, Marketing & Innovation Manager***

Comparatively, Robin noted that his Chinese employees don't resonate with green issues but are more inclined to address social and community initiatives. This is in line with the Chinese culture of collectivism and the wellbeing of the wider community. Therefore, Robin agreed that understanding the personal culture of internal stakeholders helped develop a meaningful ethos of green culture that resonates with everyone. The momentum when adopting a green orientation then also increases, since the internal stakeholders feel empowered in addressing issues that are aligned with their personal culture.

*"Sustainability is a personal relationship with the value you want to achieve. Some of my Chinese colleagues don't connect with the green targets. But the social and community stuff resonates with them. They feel empowered because the choice of initiative to support is up to them.", -* ***Robin, Supplier, Product Designer and Sourcing Manager***

Warren resonated considerably with Robin's sentiments. He noted that one of the many reasons he enjoys working with his organisation was the diverse sustainable issues it addresses. Warren shared that his Chinese origin is a huge influence on the social and environmental issues that he supports in his organisation. Reflecting personally as a homosexual man he enjoys working at his organisation because of their social support of the LGTBQ+ community. Moreover, he supports green issues due to the pollution he experienced in China. William felt that through the many sustainable issues his organisation supports, there is a genuine intent in the betterment of the organisation. Since his personal culture resonated with the organisation's ethos, he felt a sense of belonging for further personal development and growth.

*"I am gay from China, I predominately wanted to work for a company that is environmentally and socially conscious. This organisation is open minded and diverse, and you can see that with the many initiatives they support. I feel my identity is fully accepted and that my values matter to the organisation in the long term.", –* ***Warren, Retailer, Sustainable Manager***

William, who is Warren's senior manager, noted that they had developed a green culture using two significant approaches. Firstly, William previously stated that by adopting a matrix structure, multi-functional teams were formed that facilitated the sharing of green knowledge across disciplines much more easily. He added that since the structure facilitates team performance, a team-focused culture has also surfaced. The team-focused culture empowers employees in voicing opinions and ideas that are aimed at the betterment of the team and well supported by the senior managers. By adopting a team-focused culture, the internal stakeholder's perspective is recorded, reviewed, and evaluated. This approach helps the organisation to continue developing a green culture that resonates with an internal stakeholder's concerns.

Finally, Warren noted that to continue evolving their green culture beside the concerns of the current generation, they have liaised with universities through various graduate programmes. Since the graduate programme consists mostly of the younger generations, they are keener to attend the many workshops that demonstrate the different sustainable initiatives the organisation has undertaken. The workshops nurture the student's innovation and creativity in terms of encouraging their input on future sustainable objectives the organisation can pursue. This approach helps Warren's organisation to continue evolving their ethos based on the new generation's needs and concerns.

In conclusion, participants reflected on the fact that cultivating the momentum of green orientation is important to develop a green culture that is independent of a singular internal stakeholder's involvement in the organisation. Participants reflected on the various approaches they have used to develop a green culture. The approaches included conducting environmental training, inductions, regional competitions, graduate programmes, building a team-focused culture, aligning a department's objectives with sustainability issues, understanding an internal stakeholder's personal culture, personalising the adoption of green issues with the concerns of the stakeholders, and considering the concerns of future generations. The choice of approach is dependent on the organisation's commitment to green orientation and the stakeholders' receptiveness to the green culture.

## 4.3 Assessing Plausible Green Practices

The third theme that emerged in support of pursuing a green orientation was assessing the plausible green practices that are worth incorporating into an organisation. Assessing plausible green practices is defined as evaluating the green activities that need to be incorporated into the organisation when pursuing green issues. Addressing green issues means changes in the processing, procurement, marketing, and production departments in the organisation (Johnston, 2012). The practices adopted need to include a viable investment of resources and capabilities for the organisation (Johnston, 2012). Therefore, the choice between having a green practice or not varied amongst the participants. The green practices that emerged included tactical green approaches,

compromises when developing a green product, the incorporation of green processing, a value appraisal of green orientation and the concerns around green promotion.

Green tactical approaches are defined as the strategic approach the organisation uses to pursue green issues. The choice of a green tactical approach varied among participants, based on the chooses green issue and their investment in pursuing a green solution (Wu & Li, 2019). The compromise of developing a green product is defined as a concession in creating a green product. The compromises of developing a green product depends on the role of the organisation in the furniture industry (Andersén, 2021). However, since a completely green product is not achievable yet, the participants pursued various compromises in developing a green product over time.

Incorporating green processing is defined as adapting the operations of the organisation to become green. The participant's main imperative was to sustain an already existing process that is functional and efficient. The transition to green processing is incremental and based on its disruption to the current processes of the organisation (Uemura Reche, Canciglieri Junior, Estorilio, & Rudek, 2020). A value appraisal of green orientation is defined as estimating the monetary value of pursuing a green orientation. The costs incurred in the pursuit of any changes is assessed to attain a given value. The defined value however needs to be appraised accordingly with the costs incurred, customer's perceptions and a compromised green product. Finally, the concerns of green promotion are defined as considerations when promoting a green orientation. Due to rising customer scepticism about green promotions and messaging, participants considered promoting their green orientation very tactfully. Hence, depending on the validity and credibility of their green orientation, their investment in green promotion altered. Therefore, assessing plausible green practices was supported by key practices where each organisation had their own assessment for implementation. The following Table 4.3. summarises the key codes in support of assess plausible green practices.

| Theme | Sub-theme | Key Codes |
|---|---|---|
| Theme 4.3. Assessing Plausible Green Practices | 4.3.1. Green Tactical Approaches | • Pursuing impactful green issues<br>• Setting scientific based targets to measure the green solution<br>• Assessing tangible return on investment of the green solution<br>• Assessing intangible return on investment of the green solution<br>• Addressing green issues every quarter<br>• Funding governmental research grants for green innovation, R&D, and knowledge.<br>• Adopting a green lens to every project<br>• Building resilience through incremental steps |
| | 4.3.2. Compromises of Developing a Green Product | • Using recyclable materials<br>• Extending product life by increasing quality of materials<br>• Overcoming challenges of lack of durability of green materials<br>• Lack of green alternative for polystyrene<br>• Understanding customer's experience with a compromised green product |
| | 4.3.3. Incorporating Green Processing | • Current process should complement green process<br>• Incremental transition of green processing<br>• Adopting simpler green processes like recycling<br>• Needing measurement tools to track progress<br>• Exploring the opportunities caused by the domino effect of green processing<br>• Sustaining long term green processing through collaboration |
| | 4.3.4. Value Appraisal of Green Orientation | • Targeting green conscious customers<br>• Increase demand to achieved economies of scale<br>• Validating green solutions to justify the value<br>• Sharing the value appraisal throughout the supply network<br>• Assessing the value appraisal of a compromised green product<br>• Understanding customer's perception of the appraised value |
| | 4.3.5. Concerns of Green Promotion | • Customers are sceptic of validity of green solutions<br>• Addressing misinformation of green solutions<br>• Increasing customer knowledge with educational campaigns<br>• Evoking customers emotional response through story telling<br>• Addressing green washing claims<br>• Promoting the exact outcome of the green solution<br>• Demonstrating transparency in claims<br>• Unifying an acceptable industrial threshold of promoting green claims |

Table 4:3:Key Codes of Assessing Plausible Green Practices

### 4.3.1 Green Tactical Approaches

Green tactical approaches are defined as the strategic approach the organisation uses to pursue green issues. There was not one perfect tactic that all participants used; rather a variety of tactics were applied concurrently (Dai, Cantor, & Montabon, 2017). The choice of a tactical approach depended on various factors, including the organisation's structure, scale and size, and the availability of resources and capabilities (Jo & Kwon, 2021). The influence of these factors impacted the outcome of the green issue and a plausible green solution (Král & Králová, 2016). For example, aiming to reduce carbon emissions in freighting goods cannot be attained if there is insufficient investment in green transportation such as electric vehicles (Garg & Kashav, 2019). Therefore, considering the influences of a green tactical approach is important for an organisation to have an overview of their commitment to the green issue they are targeting (Ilyas et al., 2020).

As a leading sustainable retailer in New Zealand, Warren had the resources and capabilities to willingly invest in various green issues. However, instead of stretching their commitment to addressing various green issues, the company adopted an outcome orientated tactical approach. Warren's green tactical approach focused on the significance of the outcomes and the environmental gap the green issue will solve. This outcome orientated approach ensures the resources and capabilities of the organisation are invested efficiently. By taking an outcome orientated perspective, Warren was able to target the green issues that are most beneficial and impactful for the organisation.

Elijah's approach was to contextualise the green issues so he could measure their progress over time. He reiterated that by aligning the green issue based on scientific data, they could clearly measure their progress. When the green issues are non-measurable or non-contextualised, the organisation loses sight of its control and progress. As an example, Elijah noted that targeting of 30% carbon emissions by 2030 is very broad as it doesn't detail which area of carbon emissions the organisation has to focus on. Conversely, 30% of Scope 1 and 2 carbon emissions are to be reduced by 2030, thus outlining the type of emissions the organisation has control over. By implementing renewable energy and electric vehicles the organisation can measure these targets. On the other hand, Scope 3 refers to carbon emissions in the supply chain, which need

significant collaboration, investment, and reporting to measure. Therefore, Elijah's tactical approach was to contextualise and measure the objectives that are well within his organisation's direct influence.

> *"we've got a verified science-based target, so we have committed to reduce our Scope 1 and 2 emissions by 30% by 2030 from an equating base line. And we've also got a Scope 3 influencing ah target in there as well, which is to have 67% of our supplier's emissions with our science-based target by 2024, so that's a more short-term goal, and that's probably actually the more challenging of the two to be honest. But setting measurable targets helps us develop plans and have things under control. This way I can invest accordingly and assess the progress. ", -* ***Elijah, Supplier, Marketing & Innovation Manager***

Mikhail's tactical approach was to assess the return on investment of becoming green. Mikhail's intention was to ensure the momentum of green orientation wasn't impacted due to potential failures. Hence, by taking a return-on-investment approach the company targeted green issues that had either tangible or intangible returns. Therefore, the smaller green issues that had the highest return on investment were also pursued rather than dismissed due to their lower impact. Mikhail reflected that by considering the return on investment over time, the organisation builds the resilience needed to pursue more green issues.

Frank's green tactical approach was to address green issues through incremental measures. This meant gaining green experience and knowledge over time to be able to set up a quality green foundation that could eventual be industry leading. The advantage of taking incremental steps is it mitigates against the economic risks associated with addressing green issues. Since he adopted this approach, Frank gained the confidence to begin addressing bigger green issues.

> *"It was one little project, one project at a time it is just been incremental getting a good momentum to begin with the programs that we did. By committing to incremental targets, we also gained more experience and confidence in setting the big targets we have today.,"-* ***Frank, Supplier, Carbon & Environmental Performance Manager***

Warren's green tactical approach was to target new green issues in every quarter of the year. Warren's choice of a quarterly approach was to become adaptive in reflecting the evolving nature of green issues. Warren's organisation set a quarterly green issue that was addressed in rotation across the organisation. This approach allowed different departments to take the lead in addressing green issues while harbouring the experience and knowledge to be utilised in the next quarter. The risks associated with green issues were also mitigated since one department at a time was invested in addressing them. Robert considered his organisations resources and decided to collaborate with others as a tactical approach to mitigate the risks. He noticed that significant investment is needed for R&D and innovation when developing green knowledge. Since he couldn't afford to invest alone and jeopardise the economic wellbeing of the organisation, he decided to collaborate with government research funds. The government research funds provided funding for master's and postgraduate students to develop green knowledge in various disciplines. Robert's approach resulted in being privy to the results of these research projects, including flat-packaging, recycling, and reducing carbon emissions.

Robin's tactical approach was to be proactive in his current projects. Although he invested in R&D and innovation, he didn't wait for the results to apply them to his operations. Instead, Robin took a green lens to all his current projects to review any possible green issue he could address immediately. By adopting a green lens, he realised there are many opportunities that can be addressed immediately. He also investigated the outcomes to ensure they were genuinely green. For example, by investigating he noted he can switch parts of his current product with other materials that are more environmentally friendly. Although such small actions don't solve significant green issues, they do create a momentum.

Finally, participants agreed that making incremental transitions as a green tactical approach worked well in sustaining momentum. William reflected that addressing green issues on any scale comes with significant challenges. He thought the challenges they face are having the right data, setting an affordable price for green products, transitioning to sustainable supply chains, the credibility of ethical sourcing and the incurring of costs needed for these advancements. Solving each of these challenges

requires time, knowledge, and investment, which prolongs increasing the scale of green production. Hence, taking an incremental transitional approach helps build resilience in mitigating some of the highlighted risks to pursuing green issues.

> *"There is plenty of challenges, having the right data, being able to provide the same products at the same price, transitioning our supply chain into a sustainable, credibility of ethical sourcing, affordable green pricing. And we don't have an answer. But this is an incremental journey that needs resilience.", -* ***Warren, Retailer, Sustainable Manager***

In conclusion, participants highlighted that it is important to take a tactical approach in addressing green issues. The green tactical approaches varied across participants and could be incorporated concurrently, depending on an organisation's economic, resources and capability investment in pursuing green issues. Some of the green tactical approaches included outcome orientation, being science based, considering the return on investment, setting quarterly green issues on rotation, taking a collaborative approach, adopting a green lens in any small activity, taking incremental steps, and demonstrating resilience.

### 4.3.2 Compromises of Developing a Green Product

Green products are defined as products that are either environmentally friendly or have reduced impact on the environment (Andersén, 2021). The compromise of developing a green product is defined as the concessions involved in creating a green product. Developing a green product was a consistent challenge participant faced in pursuit of a green orientation (Zhang, Zeng, Tse, Wang, & Smart, 2021). As previously mentioned, green knowledge hasn't matured to the extent that all materials can be replaced with a sustainable alternative (Pham & Pham, 2021). Therefore, participants resorted to utilising the existing limited knowledge to make products that have some elements of green materials.

Elijah reflected that they focused on the production of their products instead of the product itself. Elijah reiterated that they relied on Environmental Product Declarations that identify the production stages in which steel is produced using methods that are

less harmful to the environment. As a fully sustainable steel material is not an option now, reducing the environmental impact during production helped him strive towards a green orientation.

Khloe took a design approach as a compromise to developing a green product. She highlighted that as a manufacturer she has control over designing a product that uses more materials that can be recycled at the end of the product's life. Her manufacturing organisation was a small to medium sized Kiwi owned organisation that couldn't afford to invest in certification or R&D. However, they are renowned for their skilled artisan workers who produce handmade furniture. They let their competitive skills lead the way in designing furniture that is made from sustainable timber, metal, and springs with a reduced reliance on foam. They compromised by designing a product that is made up of materials that are easily recyclable at the end of the product's life.

> *"What we're doing in the shorter term is trying to reduce our reliance on foam by going towards spring and doing metal frames that can be recycled afterwards at least.", -* ***Khloe, Manufacturer, Sales & Marketing Manager***

Edward took a product life cycle perspective as a compromise in developing a green product. He noted that by using quality materials he aims to extend the shelf life of the product. Hence, by increasing the quality of the product, the life span increases, which reduces the rate at which the product ends up in landfills. By taking a longevity approach to the product life cycle, consumption and disposal rates reduce over time. This slows down the product's environmental impact. Edwards's approach was in line with his organisation's reactive approach to environmental concerns. Although his intentions were to pursue a green orientation, his compromises focused on sustaining the economic viability of the organisation.

Francis and Farhan also took a product life cycle approach for quality and product category reasons. Firstly, they couldn't find green materials that provided the same durability and quality for the commercial furniture they produced. Since Francis and Farhan's organisation produces commercial furniture, their products had to withstand the four seasons of New Zealand. Although they did find sustainable timber, they

realised that the durability and quality was guaranteed for less than 10 years. Therefore, to mitigate the shorter green product lifecycle, they partnered with recycling and reusing organisations to focus on the end of life of the product as a compromise. Once the commercial furniture has reached its end of life they collect and send the furniture to recycling plants to reuse the wood for railways. Francis and Farhan reiterated that their intent to commit to green orientation is genuine. They chose to compromise when developing a green product by focusing on their service adaptability and the end of life of the product for recycling purposes

> *"We feel weakened because in terms of performance point of view the quality isn't up to par with our 10-year warranty policy. But we still use the sustainable timber but ended up partnering with this recycling firm who took 80 to 90 pieces of our furniture and repurposed it to make railways.", -* ***Francis and Farhan, Manufacturer, CEO & Marketing Manager***

Despite the participants' best efforts in making compromises when developing a green product, they all echoed an urgent industrial need for a green alternative for polystyrene. They reiterated that a significant issue they face is that there isn't a green alternative to packaging. Edward's sentiments truly capture the significant challenge packaging proposes for organisations when developing a completely green product. Polystyrene is used to protect the product in the boxes from damage, therefore numerous industries rely on it. Edward noted that there is no sustainable alternative to polystyrene so no matter how much they invest in the compromises of developing a green product, the final packaging is not green. Edward called for industrial collaboration in investing in R&D to produce a sustainable packaging alternative.

> *"a large amount of our import product arrives here in boxes which has a large amount of polystyrene packaging in it. Which is good for protective packaging, but it is useless in terms of being able to recycle or to do anything else with. The whole industry must invest in more R&D to come up with a sustainable alternative. We need solutions that address the industry needs at a product level.",* ***- Edward, Manufacturing, Business Manger***

Finally, Brianna highlighted that understanding customers' experiences with the new compromised green products is important when improving their pursuit of a green orientation. She noted that the demand for green products from customers fuels the investment in pursuing the compromises involved in developing green products. Therefore, the customer's role in sharing their feedback is important. Organisations need this to further develop their approaches. Brianna reflected that having relationships and communication with customers is important to fuel the organisation's efforts in developing their green products.

In conclusion, participants reiterated that green knowledge hasn't advanced to the extent in which all elements in a product have a green alternative. Therefore, participants resort to making compromises that include greening the production of the product, designing a product that uses more green or recyclable raw materials, extending the product life cycle through using quality materials, and collaborating with product stewardship programmes to recycle the product at the end of life. Participants demonstrated resilience in pursuing the compromises that come with developing a green product; however, two overarching challenges remained. Firstly, the industry's reliance on polystyrene in packaging reduces the impact of the compromises they made because there is no green packaging alternative. They called for industrial collaboration to help develop a green alternative for packaging. Secondly, customers needed to engage with organisations to share their feedback and experience of the compromised green products. Such insights fuel the participants' commitment to developing a green product.

### 4.3.3 Incorporating Green Processing

Incorporating green processing is defined as adapting the operations of the organisation so it becomes greener. Incorporating green processing was met with a threshold of constraints from the organisation's resources, capabilities, and economic investment (Sharma, Mangla, Patil, & Liu, 2019). Several participants reaffirmed that at a practical level, incorporating green processing was an early transformation in pursuit of a green orientation. However, when constrained by the threshold of investment, the participants noted that for further development, collaborations with supply chain

partners are needed (Merkel & Seidel, 2018). The following green processing methods reiterated by participants are within the means of their internal capabilities. The involvement of partners will be discussed in Chapter 5.

The overarching assessment from the participants who incorporated green processing was that the methods were complementary to their current operations (Iyer, 2011). Participants wondered whether the disruption in current operations may have a negative impact on the economic wellbeing of the organisation. Frank reiterated that incorporating green processing is a transitional process that slowly integrates environmentally friendly approaches into existing operations. Frank strived for green processing by adopting a holistic perspective of the life cycle of his operations. He identified areas that had a significant impact on the environment and areas that could be easily transformed to further green processes. Frank's approach relied on the Environmental Product Declaration, a certificate that details all the operations of the product. Inspired, he then mapped out other parts of his operations that could turn green. He has now successfully incorporated sustainable procurement, electric vehicles and harvesting rainwater into his company.

> *"The best place to begin is having a life cycle analysis of the product process. We look at all the components that fit with EPD in our productions. We can see the hotspots of environmental impact our product production has like not having sustainable sources, carbon footprint. It gives us a holistic understanding on how we impact the environment. Through the EPD process we realised that we could find more sustainable steel in Korea compared our sources in New Zealand. We took a step-by-step phase of transitioning from combustion engines to electric vehicles. Now we are planning to harvest rainwater for better water management in our production.", -* ***Frank, Supplier, Carbon & Environmental Performance Manager***

Mikhail's approach was to identify the easiest green process that could seamlessly be adopted into their operations. Mikhail as a logistic organisation bears a significant number of wooden pallets, packaging, and freight waste. Hence incorporating recycling operations into the green process was a seamless activity that reduced waste but didn't disrupt the freight operations. By expanding the categories of recycling bins,

their waste production became more efficient. Mikhail reflected that since recycling was an easy thing to incorporate, the organisation quickly adapted, and this is now a daily routine. However, Dominic shed light on the further developments that are needed in green processing.

Dominic argued that measurement tools are needed industrially to track the progress through the whole recycling process. He thought that measurements are important tools that help organisations track their progress in green processing. Dominic wanted to rely on scientific data and figures to accurately calculate the impact of his recycling processes over time. Unfortunately, measurement tools are another form of green knowledge that needs further research and development. Hence, Dominic currently tracks the utility bills to understand the consumption of supplies in the office.

> *"Give us some measures because what gets measured gets done and then we can track the progress. It will also influence peoples' conscious attempts of reducing their printing for example. There is no standardised tool, but we tabulate it by recording our bills. But it will be very good to have a robust measurement for all recycling purposes in the operation.",* ***- Dominic, Logistics, Health, Safety and Environmental Officer***

Robert's compromise in developing a green product created a domino effect in his office and influenced his green processing ideas. Robert wanted to reduce packaging waste and designed products that were flat and could be packaged in smaller cardboard boxes. However, through shipment he realised he has also saved energy and cost on freight. One trip could transport double the load, reducing carbon emissions. Robert noted that through such incremental steps, they were exposed to other opportunities, including adopting electric vehicles and solar panels. Robert's sentiment refers to the overlapping nature of green practices that if assessed tactically can be introduced efficiency throughout the operations in multiple ways.

> *"We designed flat-packing furniture for shipping, which will reduce freight, obviously. A small design project influenced our recycling process. Now with the reduced carbon freight we are investing in electric vehicles. We recently also*

*installed solar panels for renewable energy for the office.", -* ***Robert, Manufacturer, Sustainable Manager***

Milo's organisation incorporated green processing as a significant part of his business model. He started off by purchasing used furniture at a bulk price, then refurbishing and selling the items. His approach has been economically viable for 13 years and was inspired by the educational industry in New Zealand. He noticed that a niche market of students bought furniture to use for a couple of years during their studies, before leaving it behind. His green business model was one of the few examples of complete green processing participants that have worked recently in New Zealand. Milo's organisation was a great example of an emerging green process developed further to become a green business model.

Although various approaches were available to the participants, Sebastian said that as a franchisee retailer, except for internal recycling, there is not much he can do. Therefore, to afford to incorporate impactful green processes such as electric vehicles for freight, and green product designs he called for collaboration throughout the chain. He thought that by sharing resources and capabilities throughout the supply chain, investment in green processing could be accelerated.

Mikhail echoed the sentiments about environmental collaboration. He thought that environmental collaboration for green processing ends is inevitable. For example, recycling is very impactful, but it is not the end of the operations. Eventually an employee must collaborate with waste management, product stewardship and customers when removing the recyclables for refurbishment. It is evident therefore that a threshold of capabilities is reached when an organisation incorporates green processing. After which collaboration with others can help facilitate the integration of green processes.

"W*e use returnable pallets, cages, and things like that, but again, they have limitations. To overcome the challenges, we work quite closely with Waste Management in New Zealand who are our national suppliers. We also have waste exchange arrangements with suppliers and customers. We recycle used homeware for one of our customers, we purchased electric vehicle from other*

*suppliers. The sustainable journey best partnered with others to join resources. No one can do it on their own.", -* ***Mikhail, Logistics, Head of Business Development Team***

In conclusion, the participants agreed that the integration of green processing can be pursued in various ways, but it is best done to complement the current operations. Hence, participants pursued a transitional approach to life that incorporates recycling, tracking, and measuring waste, having a holistic view of overall operations, and identifying opportunities to compromise when developing a green product or process. However, some participants created an independent green business model through green processing, while others needed a collaboration with supply chain partners to incorporate green processing. Overall, the incorporating of green processing was constrained by the organisation's resources, capabilities, and economic investment. Hence, environmental collaboration throughout the supply chain emerged as solution for further development of green processing.

### 4.3.4 Value Appraisal of Green Orientation

The value appraisal of a green orientation is defined as an estimation of the monetary value of pursuing a green orientation. Depending on the green orientation, the participants expected a varied appraisal of their value (Hald, Wiik, & Larssen, 2020). For example, the participants didn't expect to be paid more for being green conscious leaders or developing a green culture. However, the green tactical approaches, compromises in developing green products and incorporating green processing did incur a cost that was reflected in the final price offered to customers (Yoo, Rhim, & Park, 2019).

The primary reason that a value appraisal for companies with a green orientation emerged was because the participants discussed the trade-offs associated in addressing green issues (Esfahbodi, Zhang, & Watson, 2016). Edward reflected that due to the evolving nature of green issues and the developments in green knowledge, the route to green orientation is an uncertain one. Therefore, investing in green issues is a trial-and-error process that might not lead to a return on investment. Hence, the uncertainty of the returns is an economic vulnerability that is a trade-off for pursuing green issues.

Moreover, since the solutions to green issues are not yet mature, the route to a green orientation involves the significant investment and costs associated with a high economic investment. The solutions are not produced at a mass production scale, hence acquiring green solutions is also costly. Edward reflected on the idea that the value of committing to a green orientation should be appraised despite the uncertainties. Not all green orientation incurred a long-term cost, however. Robert reported that by installing solar panels as a green processing approach he had reduced the organisation's reliance on electricity, which had resulted in significant decrease in utility bills. He reflected that the expense was worth the investment as the returns were greater in the long term.

Elijah did however expect a higher value for his green orientation. Elijah invested heavily in recording, measuring, and reducing carbon emissions throughout his supply chain. This required him to invest in software, hardware, green transportation, and partnerships. Elijah's investment resulted in him being positioned as a leader in the sustainable steel industry; however, the expenses incurred resulted in the steel being priced more highly. Although this meant they lost parts of the market, there were green conscious customers who were willing to pay a higher price for a product that is better for the environment. The customers also had the benefit of promoting their own products as sustainably sourced raw materials. Interestingly, Elijah's commitment to green orientation and his response to the green conscious customers resulted in other industry players becoming greener conscious due to the marketing value of green practices.

> *"Our product is currently premium priced in the market, but it is certified green. We changed suppliers and used less carbon routes. It required a lot of investment, but the returns are appreciated in the market. Now customers come to us and are we willing to pay for a higher sustainable steel because then they can confidently market their product with a certified sustainable steel label.", -* ***Elijah, Supplier, Marketing & Innovation Manager***

Warren, however, was hesitant to claim a higher value because of his commitment to a green orientation. Warren stated that as a retailer, justifying the higher value claim for his customers he needs a complete assurance from his supply chain that the products are in fact green. He shed light on the fact that in the supply network discrepancies exist,

such as a lack of audits when implementing certification guidelines or when the green practices of subcontractors can't be assured. Therefore, Warren noted that once the supply network has been scrutinised and a validation of claims made, then justifying a higher value for customers can be confidently assured. However, this level of validation across the supply network needs significant collaboration and coordination.

> *"We need to justify the higher price for our sustainable products to customers. I am very hesitant to do that unless we have a robust rooting of audits and certifications. We must scrutinise the credibility of the whole chain and the practices of our sub-contractors. Then we can confidently say the product is green and warrants a higher price point.", –* ***Warren, Retailer, Sustainable Manager***

Mikhail was also hesitant in appraising the value of his green practice. Mikhail thought that the value should be shared amongst the supply network partners, rather than being extracted by a single organisation. Mikhail didn't deny that the investment in pursuing green orientation is high and requires a value appraisal. However, as described previously, the incorporation of green processing with supply network partners is inevitable. Therefore, the value claim should be shared equally throughout the chain as it is a joint effort with several partners. Mikhail highlighted that it is common for suppliers or sub-contractors to bear the significant investment of green processing but for manufacturers or retailers to gain the most value due to their customer facing positions in the supply network. Therefore, Mikhail agreed with Warren that an appraisal of value requires the supply chain collaboration.

Edward noted that his customer's perceptions and attitudes about green products is still uncertain. He thought that green conscious customers who value the green efforts are a niche market that has a comparatively low demand compared to other customers. Hence, in the long term the return on investment isn't in an equilibrium balance to the costs incurred by organisations for green orientation. Therefore, for Edward to claim the value of his investment, he needs a better understanding of his customer's decision-making process when purchasing products that have some green attributes as opposed to other influencing factors such as product design and colour. Understanding the green conscious customer's perception of price is also important to provide an insight in the

threshold people are willing to pay for green attributes. Edward too felt that the appraisal of value claim was still very uncertain and ambiguous.

Isabella echoed those sentiments and was also interested to know more about a customer's response to the value claim of green orientation. She too wondered if other product properties such as design and colour influenced people's choices when purchasing a green product. However, she was hopeful that through investing in educational campaigns, organisations could help customers understand the significant role they have in demanding and purchasing green products. Isabella also noted that once a mature stage of demand is achieved then claiming value for a green orientation will become a norm and justified in the industry. She thought that once a larger demand drives the supply of green products then the higher cost will flatten due to the increase in economies of scale.

> *"We have the biggest challenge of advocating internally and educating our customers to justify the price of green products. Customers demand and purchasing decisions drives the demand to increase the scale of green production. Once customer's demand reaches a mature stage the industry will respond, and the cost of sustainability will become a norm. And of course, at a higher scale of production then the price will flatten. For now, we must invest in educating customers about their role in sustainability", -* ***Isabella, Retailer, Sustainability Developer***

In conclusion, participants agreed that the investment and the costs incurred by a green orientation deserves an appraisal of value for a means of return. However, participants had contradictory sentiments to appraising a higher value for their green orientation. Some participants were able to justify their claims with green conscious customers, while others needed coordination and collaboration in the supply chain to validate the credibility of their higher value claims for their green orientation. They also noted that coordination and collaboration in the supply chain means the value claim should be shared throughout the network, rather than extracted by one organisation. Some participants, however, felt that the customer's attitude, purchase decisions and price perception of green products was still uncertain and ambiguous. They noted that educational campaigns are needed to drive demand and increase economies of scale for

green products that will eventually rationalise the higher value claim and make it an industry norm.

### 4.3.5 Concerns of Green Promotion

Concerns of green promotion are defined as considerations when promoting a green orientation. In the preceding themes, the role of the customers as drivers of green orientation became evident through their engagement and demand for green products (Kirchoff, Tokman, Koch, & Satinover Nichols, 2011). Therefore, the purpose of green promotion was to increase the engagement and demands of customers within the green orientation of the organisation (Hsuan-Hsuan Ku, 2012). Participants hoped that through this engagement the industry would recognise the market's increasing demand so pursuing green issues would become the norm. Currently, there is a market demand for green conscious customers; however, as stated previously, their attitudes, decision making, and price perceptions need further investigation (Hu, Liu, Yuen, Lim, & Hu, 2019). Therefore, as much as participants agreed that green promotion is a vital practice, they also expressed various concerns in advocating their green orientation to customers. Interestingly, this was evident across the participants as uniformly they promoted some or very little of their attitude towards a green orientation. Their docile approach stemmed from their concerns about green promotion.

Francis and Farhan were concerned that promoting their green orientation was redundant, as tangible outcomes of their efforts are still compromised. For example, promoting a compromised green product is not genuine, as other elements of the product are not green. Although the solution to this resides in the further development of green knowledge, Francis, and Farhan's confidence in promoting their green orientation has relied on this. Hence unless the green product is not compromised, their stance in promoting their efforts will continue being docile. Edward echoed similar concerns about the lack of green packaging. Polystyrene, as mentioned previously, is used throughout the industry, and has no green alternative. Edward reflected on the notion that promoting a green product that comes in polystyrene can be considered as misinformation from the perspective of customers. This misinformation may create the wrong impression of the brand for customers, which can be more detrimental than promoting the organisation's green orientation.

*"There is a mix match of sustainable product in a non-sustainable packaging. If gives the wrong impression to the customer.",* ***- Edward, Manufacturing, Business Manager***

Warren spoke about the fact that one of the reasons they are not vocal in their green promotion is the lack of customer knowledge. Warren noted that although customers are aware of climate change and the importance of addressing green issues, there is a lack of knowledge that persists in the domain of plausible green solutions. For example, customers are aware that sustainable timber is good for the environment, but do they have an in-depth knowledge about how sustainable timber is sourced? Or what is the exact point of difference between sustainable and non-sustainable timber? Warren noted that currently educational campaigns are more useful than commercial green promotions. He added that it is important to justify the value claim of green orientation through educational campaigns that adopt a story telling approach which evokes an emotional appeal when focusing on the distinct impact that green products have on the environment. Warren concluded that customers must engage with the promotional campaigns at a personal level and understand the impact that green orientation has.

Elijah echoed similar concerns and repeated that customers don't know the challenges the industry is facing in addressing green issues. One of the main challenges Elijah was facing was the lack of green solutions available for participants to implement, as green knowledge is still in the research and development phase. Elijah was very careful when messaging his promotions and instead communicated facts that could be verified. For example, he didn't promote his organisation's practices in reducing carbon emissions, as measuring their progress is still a current challenge. Instead, he could easily substantiate that the steel he procures from Korea has 30% less carbon than New Zealand's steel. As tangible sourcing documents exist that substantiate this claim, Elijah's organisation could advertise this fact. However, even with the validation of the certificates, Elijah reported that some customers still have scepticism about the credibility of the information. He said that customers presume the certifications have been bought by organisations; this undermines the power of the message. Customers continue to express doubt over the claims verified in green promotions.

Brianna, however, relied on the ecolabels and certification to at least convey the message to customers that she isn't complacent in responding to environmental issues. Her intention has been to protect the reputation of her brand against complacency claims. She wants to convey to customers that at least she is being responsible for the waste she generates. Therefore, despite the scepticism that prevails not pursuing any form of green promotion also proposes that the organisation is complacent to environmental issues. Robert wanted to convey the impact and differences that his organisation's commitment to green orientation has made. Robert's sentiments stem from customer's green washing claims as a reaction to the many exaggerated campaigns they have seen. Therefore, Robert's motive was to differentiate himself from "commercialised to impact based messaging" by promoting his social and community initiatives. For example, he enjoyed giving back to the community rather than promoting his recycling initiatives.

> *"It is not a sense of we are not putting out adverts, it is more a case of this is what we are doing judge us by our actions and what our behaviour is and what we have done not what we necessarily are talking about. so many are exaggerating their intentions and customers are smarter, we are hesitant to be promote our green stuff because we might get called out for green washing. But we are more comfortable in promoting our social initiatives", - **Robert, Manufacturer, Sustainable Manager***

William agreed whole heartedly and noted that his docile green promotional activities are also due to concerns about green washing. William doesn't blame customers for such claims but repeated that they come from a lack of knowledge on their part, and a lack of transparency in the chain from the organisation's perspective. He restated that, like Elijah, until he can validate the claims of his green practices, he won't engage in a dominant green promotional campaign.

Edward thought that to validate the claims, the industry must come together to moderate the discrepancies that exist in the supply network. Edward often comes across eco labels on two separate product materials, one being natural wood and the other being a Medium Density Fibreboard (MDF) product. MDFs are made of wood fibres bound together using wax and a resin binder, that then makes the product unrecyclable.

Edward highlighted that such industrial discrepancies are plentiful in the industry and that they influence a customer's perception about eco labels. Unless the supply chain's operations are validated and standardised, proactively pursuing green promotions risks damaging reputations, a distrust of customer and greenwashing claims. The industrial response to these discrepancies also helps set a unified approach when claiming green product at a certain percentage. This is needed to increase demand despite the lack of green alternative for all the product's elements.

> *"The industry needs to decide at what point it can make a claim is sustainable. I have seen products made from sustainable timber share the same logo as MDF products. Unless we solve these discrepancies, the customers will have negative perceptions about green marketing because of the inconsistent messages everyone has. there is no acceptable level that says I can fly the flag that says that I am green. Do I have to be 70%, do I have to be 80%? It takes time to change this perception, but it is not a one person's job, the whole industry must come together to have consistent messaging.",* ***– Edward, Manufacturer, Business Manager***

Isabella said that to validate their claims, organisations must be proactive in engaging with their supply chain partners to build a credible story. Isabella's organisation began its green promotional approach by ensuring no one in their supply network participated in negative practices. Once this was assured, they began promoting their ethical practices such as not using child labour and providing fair wages. By synchronising their efforts throughout the chain, they were able to build a credible story that demonstrated their commitment to green promotion in the long term.

In conclusion, participants reiterated that green promotion is critical to increasing customer demand. However, participants were passive in their green promotions due to various concerns such as the lack of green alternative solutions, customer's scepticism, green washing claims, the lack of verification of claims in the supply chain and a lack of industrial moderation of discrepancies. When considering these concerns, participants resorted to educational campaigns, storytelling, outcome orientation and eco-labels to promote their green orientation. A lack of green promotion resulted in

claims of complacency; hence participants were consciously active in their green promotion approaches.

## 4.4 Summary of Key Findings of Green Organisational Orientation

This chapter explored the themes of green organisational orientation as a green conscious leadership, forming a green organisation and assessing plausible green practices. These are identified as the internal capabilities needed in the organisation to pursue green issues. Green conscious leadership emerged as the foremost important capability needed to drive and commit an organisation to pursuing green issues. Hence the leader's personal green consciousness and investigative role helps drive the organisation's commitment to addressing green issues. Next the organisation must be receptive to the changes needed in the pursuit of green issues. Forming a green organisation includes supporting the sub-themes of green organisational restructuring, understanding the stages of environmental concern, and developing a green culture. Forming a green organisation helps facilitate the tangible and intangible capabilities of internal stakeholders when pursuing green issues. Finally, assessing plausible green practices includes the continuous evaluation of the possible green practices that might be adopted in pursuit of green issues. Green practices include tactical approaches, compromises when developing a green product, incorporating green processing, a value appraisal of green orientation, and concerns about green promotion. The authenticity of green claims in each green practice emerged as a significant factor that needed to be validated throughout the supply network. Hence, when assessing plausible green practices, the collaboration with the supply network begins. In Chapter 5 the category of environmental collaboration is further explored as is the coordination and cooperation of the supply network in addressing green issues.

# Chapter 5 Findings of Environmental Collaboration

In the previous chapter, the green organisational orientation's themes alluded to the fact that when organisations become green, they are bound by their internal resources and capabilities. For example, to incorporate green processing, organisations have to collaborate with their suppliers, manufacturers, freighters, retailers, and customers (Uemura Reche et al., 2020). The role of environmental collaboration has therefore emerged as an instrumental catalyst in furthering the green orientation of organisations with partners in the supply network (Braun & Clarke, 2019). Environmental collaboration is defined as the joint effort of the supply network to attain environmental objectives (Vachon & Klassen, 2008). Hence, the overarching research question that guided the exploration of environmental collaboration was:

"How does green orientated organisations environmentally collaborate in the supply network?"

The choice of partner for collaboration depends on the green issue the organisation wants to address (Kleine Jäger & Piscicelli, 2021). For example, a large-scale retailer wanting to produce green products will collaborate primarily with procurement and manufacturing partners (Boddy et al., 2000). An organisation wanting to reduce the carbon emissions in their freight will collaborate primarily with their logistics partners (Saruchera & Asante-Darko, 2021). It is important to note that the choice of partner is not restricted to one (Li, Shi, et al., 2020). For example, a manufacturer wanting to produce environmentally friendly furniture might have to collaborate with their steel, metal, wood, and textile suppliers simultaneously (Rayhan & Ahmad, 2021). Additionally ,in a typical supply network each organisation has at least two partners to rely on in case of operational failure (Fawcett et al., 2015). Therefore, the choice of two steel suppliers for the manufacturer will be based on the complementary resources and capabilities between them and the strength of the relationship that exists (Tirkolaee, Mardani, Dashtian, Soltani, & Weber, 2020). Other external factors that impact an organisation's choice of partner is its geographical location (Ghadimi, Ghassemi Toosi, & Heavey, 2018). Partners that are overseas are bound by regulations and cultural and language

barriers that can influence the quality of environmental collaboration between partners (Awan et al., 2018).

Taking into consideration the context at which environmental collaboration occurs, it is evident that a supply network has a myriad of unique resources, capabilities, knowledge, information and competencies that could facilitate environmental collaboration (McDougall et al., 2021). The myriad of relationships that are horizontally and vertically dispersed in the supply network also influence environmental collaboration (Ozdemir et al., 2017). The two overarching themes that support the category of environmental collaboration include supply chain and industrial level. The following Figure 5.1 visualises the themes and sub-themes that is explored in this chapter:

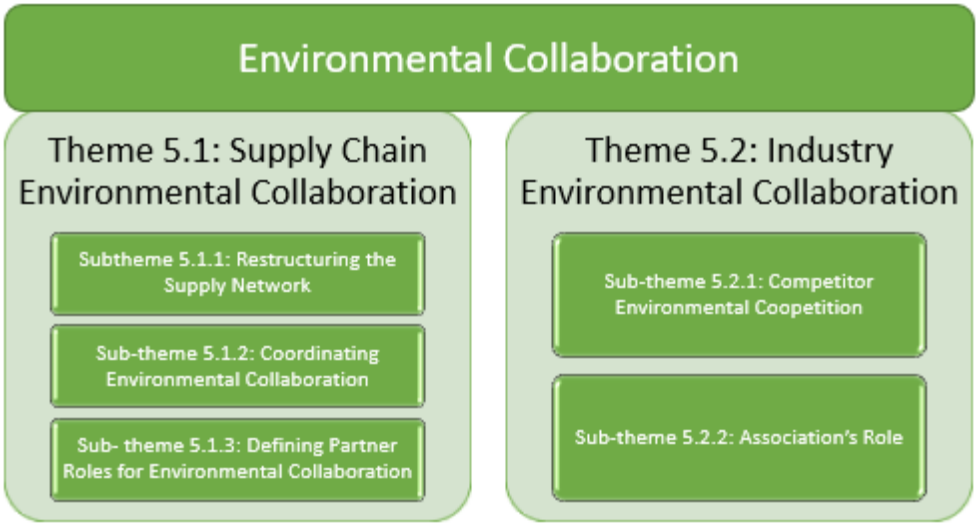


Figure 5-1: Thematic Findings of Environmental Collaboration

## 5.1 Supply Chain Environmental Collaboration

Environmental collaboration is the jointly planning of the supply chain network for green issues (Gölgeci et al., 2019). This jointly planning needs synchronisation of operational and relational capabilities as an extension to an existing collaboration that drives the performance of the supply network (Mehdikhani & Valmohammadi, 2019). Hence, the performance of environmental collaboration is depended on the structure, coordination and roles that exists in the supply network (Merkel & Seidel, 2018). The three sub-themes that support supply chain environmental collaboration is restructuring the supply network, coordinating environmental collaboration, and defining roles.

Restructuring the supply network is defined as the re-alignment of the supply network to assess plausible partners for collaboration. A supply network is made of multiple tiers, across industries and regions with a myriad of resources and capabilities (Govindan, Shaw, et al., 2021). By restructuring the supply network participants can identify the partners and the cross cutting resources and capabilities that exists in the chain (Ramanathan & Gunasekaran, 2014). Supply networks form their structure organically as the partners in the network evolve constantly (Feizabadi, Maloni, & Gligor, 2019). However, there is a lack of visibility of partners across the tiers of the (Saqib & Zhang, 2021). Hence, restructuring the supply network helps shed light on the possibilities for collaboration amongst partners (Saqib & Zhang, 2021).

Coordinating environmental collaboration is defined as organising the environmental collaboration process in the network. Once partners are identified coordination of the collaboration helps sustain the momentum of the network in pursuing green objectives together (Wassmer, Pain, & Paquin, 2017). As mentioned previously environmental collaboration is an extension of an existing operational collaboration that is evident in the chain (Mehdikhani & Valmohammadi, 2019). Hence, it can be natural for the partners to treat environmental collaboration as a “nice thing to do” activity (Jahanshahi & Brem, 2018). Hence, coordination is needed to organise the supply network towards a pursuit of a proactive environmental collaboration.

Defining roles for environmental collaboration is identified as outlining the role and responsibilities of partners. Partners contribute unique resources and capabilities that sustains the momentum of environmental collaboration (Li, Shi, et al., 2020). The purpose of this research was tracking the collaborative partners in the supply network of the Furniture Industry. Hence an interesting lens that emerged where the unique roles each type of partner contributed to environmental collaboration in a supply chain network. The Table 5.1. summarises the key codes of supply chain environmental collaboration.

| Theme | Sub-Theme | Sub-Sub Theme | Key Codes |
|---|---|---|---|
| Theme 5.1. Supply Chain Environmental Collaboration | 5.1.1. Restructuring the Supply Network | | • Assessing partnerships<br>• Identifying green issues<br>• Aggregation of network partners<br>• Mapping interconnected regions<br>• Mapping interconnected industries |
| | 5.1.2. Coordinating Environmental Collaboration | Identifying existing resources and capabilities | • Recognising underutilised resources<br>• Recognising underutilised capabilities<br>• Assessing market size of customer demand<br>• Assessing market share of green production<br>• Cultivating Green Marketing in Supply Network |
| | | Integration of Information and Knowledge | • Sharing aggregated information<br>• Sharing aggregated knowledge<br>• Creating green knowledge<br>• Recording green knowledge<br>• Information sharing on scale of green production<br>• Information sharing on scale of green demand |
| | | Formalising Environmental Objectives | • Outlining targets in contracts<br>• Outlining non-negotiable practices<br>• Compatibility of targets with regional regulations |
| | | Unifying the Green Standards | • Outlining dependencies of targets to standards<br>• Utilising certifications<br>• Utilising frameworks<br>• Identifying overlapping standards<br>• Synchronising the compatibility of standards across industries |
| | | Developing Environmental code of conduct | • As a knowledge cultivating tool<br>• As a knowledge sharing tool<br>• As a tracking progress tool<br>• Raising standards in the industry |
| | | Constant Environmental Reporting | • Capturing progression<br>• Highlighting green issues that needs addressing<br>• Utilising global reporting frameworks for structure<br>• Identifying partner's role and contribution<br>• Development tool for future environmental collaboration |
| | | Monitoring of Environmental Practices | • Encourage more involvement from supply network<br>• Provide transparency in supply network<br>• Validating the progress<br>• Identifying opportunities for more collaboration<br>• Identifying opportunities for sharing expertise<br>• Strengthening collaboration |
| | 5.1.3. Defining Roles for Environmental Collaboration | Suppliers Role | • Providing critical green knowledge<br>• Providing green raw materials<br>• Testing green innovation for further development<br>• Critical to increase economies of scale<br>• Providing green stories for green promotion |
| | | Manufacturer's Role | • Hub of collaboration in the supply network<br>• Responsibilities of eco-designing<br>• Remanufacturing as future target<br>• Responsible to increase scale of green production |
| | | Logistics Role | • Providing electric vehicles<br>• Providing less carbon emission routes<br>• Reverse logistics can be done by other partners<br>• Catalyst of connecting other supply networks with intention of collaboration |
| | | Retailer's Role | • Sharing information on customer demand<br>• Addressing attitudinal- behavioural gap of customers<br>• Understanding customer's expectation<br>• Understanding customer's experience<br>• Addressing customer's scepticism in green promotion<br>• Engaging customers as a collaborating partner |

Table 5:1: Key Codes of Supply Chain Environmental Collaboration

### 5.1.1 Re-structuring the Supply Network

Restructuring the supply network is defined as the re-alignment of the supply network to assess plausible partners for collaboration. Re-structuring the supply network is the overarching primary step taken by participants to understand their existing alignments (Jo & Kwon, 2021). Since the supply chain network is relationally and operationally complex, the partners are dispersed through multiple tiers across regions (Jia, Gong, & Brown, 2019). One common challenge organisation's face is that they only foresee their 1st or 2nd tier partners and are not aware of other alignments that exists throughout the chain (Wei & Wang, 2017). By consciously re-structuring the supply network, participants can identify potential new partners that complement the environmental collaboration process. Alternatively, they can identify overlapping resources that can be satisfied by one or two partners versus more partners across various tiers that complicates the collaboration. Merging the capabilities in the network helps create a lean operation that is more efficient and bears less carbon emission (Gligor, Feizabadi, Russo, Maloni, & Goldsby, 2020).

Warren highlighted their interest in collaborating with partners made them realise the abundance of alignments that exists beyond their immediate 1st and 2nd trier chains. They took the time to outline their partners all throughout the chain in various regions. They assessed each partner's capabilities that complements the collaboration process for environmental objectives. They were also able to recognise the different countries their current alignments exist. By restructuring the supply network and assessing the capabilities available, Warren could practically define the environmental issues and objectives that needs addressing in the chain.

Isabella agreed with Warren's approach, and she too began tracking the partners in the chain. Isabella took a macro perspective of the supply chain and identified the key players that can help achieve the environmental objectives. She objectivity assessed the capabilities of each partner to match with science based environmental targets. By taking an individualistic approach to each partner they were able to have a personalised conversation to collaborate on environmental issues that are mutually beneficial. She did highlight that this approach is a continuous process of investing in partner's

capabilities. The benefit of restructuring the supply network through re-alignment is that the current relationship bonds increases while they are always introduced to likeminded green organisations pursuing green issues. Organisations can then rely on increasing the momentum of environmental collaboration over time.

> "*We re-designed a supply chain that is made up of close suppliers to reduce our emissions. And we worked closely with a baseline of 17 suppliers over 3 years. We designed the sustainable packages based on science-based targets and we invested in them with long term agreements. But we had to look at the industry and have tailored-made conversations*"- ***Isabella, Retailer, Sustainability Developer***

William shed light on the challenges of restructuring the supply network. He reiterated that it is a long process that is based on an objective assessment of integrating complementary resources while trying to achieve a seamless collaboration that is value driven. William emphasised that restructuring the supply network is a balancing act of considering the current trade-offs of green objectives while considering the future of their product catalogues. William echoed Isabella's sentiments on continuous development of restructuring and added that environmental collaboration is an ongoing process that requires continuous investment.

> ***"****It is a journey, it is an ongoing process, we flipped the table and renewed our supplier based, we changed based on our needs, the evolution of our catalogue, the evolution of our requirements, the evolution of our customer's demands and their fit within our network strategy and within our organisation's strategy so it is done organically and strategically at once"*- ***William, Retailer, Chief Sustainable Officer***

Nathan as an association wasn't influenced by environmental collaboration at a supply chain level, but his role in the industry required him to interact with partners in a supply network. Nathan, spoke on behalf of forest farmers and highlighted that they are fragmented in the industry. They face high uncertainties in domestic suppliers buying their timber, hence they feel very vulnerable in the chain. To overcome this feeling, they often rely on international buyers who purchase the young timber early on. By selling

the timber too early, the domestic supply is reduced considerably. This leaves domestic suppliers to use imported timber that is not sustainably sourced and increases the carbon emission of freight. He called for organisations to coordinate the domestic supply and demand of green products. If domestic partners consciously restructured their chain of procurement, they could increase the collaboration opportunities with domestic suppliers. Through increasing domestic collaboration, the environmental issues facing the industry could be addressed jointly.

Francis and Farhan echoed Nathan's comments, they too restructured their supply network and began interacting and engaging with 3rd tier suppliers. They highlighted, that doing this allowed them to fully understand the issues and concerns evident in the chain that are opportunities for collaboration. They noted that by identifying the bad practices, they formed immediate opportunities for environmental collaboration. Francis and Farhan reiterated that by finding new alignments the collaboration process became more cost effective as there was significant opportunities for sharing of resources and capabilities to target mutually beneficial objectives.

Mikhail however shed light on the challenges of restructuring of the supply network, he reiterated that the regional disparity of the partners provides geographical, cultural, and legal constraints. So, the environmental objectives outlined in the agreements need to be accommodating and flexible to regional regulations. By integrating the regional concerns in the agreements, the environmental collaboration became more synchronised for a mutually beneficial partnership.

> *"Well for us there's quite broad operating contacts but, the decision-making is localised, so it sits with those regions. They decide how best to respond to local regulations. We have got quite a bottom-up approach to some of this; it does not come from one mandated call. It is collaborative. Not dictated."* ***- Mikhail, Logistics, Head of Business Development Team***

William concluded, that through restructuring of the supply network he was also exposed to new information and knowledge that is embedded in the chain. Supply chains have a myriad of information and knowledge provided by various partners. William noted that restructuring their chain provided opportunities for exposure to new

green knowledge. Green knowledge is considerably important to address the evolving green issues facing the chain. Through restructuring of the chain, the partnerships become closer and knowledge sharing became more prevalent. William reflected those opportunities for learning green knowledge is plenty because the furniture industry is in mature stages with significant harboured knowledge. In hindsight during the process of restructuring the supply network, William came across many likeminded organisations that were also green value driven and looking for partners to collaborate with. William reflected that finding new potential partners gave him hope to accelerate the process of environmental collaboration in the chain.

To conclude, the primary theme that emerged in pursuit of environmental collaboration in the supply chain was restructuring the supply network. During the restructuring of the chain, organisations foresaw past their 1st and 2nd tiered partnerships and identified all plausible partnerships evident in the chain. Through this process the cross-cutting resources and capabilities were eliminated by adopting a lean approach to harvesting closer partnerships for environmental objectives. The restructuring of the supply network provided opportunities for sharing green knowledge, creating adaptable agreements with regional obligations, and finding likeminded partners that accelerates the environmental collaboration.

### 5.1.2 Coordinating Environmental Collaboration

The second subtheme is coordinating the environmental collaboration in the network that involves a seven-step process. Coordinating environmental collaboration is defined as organising the environmental collaboration process in the network. The steps can be implemented concurrently but presented in an orderly manner that best creates a seamless environmental collaboration between partners. The coordinating steps included identifying existing resources and capabilities, integration of knowledge and information, formalising environmental objectives, unifying the green standards, developing code of conducts, constant environmental reporting, and monitoring of environmental practices. The proceeding sections details each step as emphasised by participants.

#### 5.1.2.1. Identifying Existing Resources and Capabilities

Resources are defined as the supplies and capital of the organisation that is valuable and seen as an asset to the organisation's overall competitive advantage (Dyer & Hatch, 2006). Capabilities are defined as the organisations ability to govern its resources towards attaining a competitive advantage (Dyer & Hatch, 2006). A supply chain network is a myriad of resources and capabilities embedded horizontally and vertically across various regions (Hadjikhani & Thilenius, 2005). Therefore, there is also a myriad of opportunities for partners to collaborate and share resources and capabilities(Sun et al., 2019). However, the overarching challenge participants have been experiencing is identifying the resources and capabilities that exists in the supply network. Part of this challenge stemmed from the lack of coordination across the supply network.

The alignments that make up the supply network are formed organically throughout the tiers without the knowledge of others in the chain (Sun et al., 2019). Hence, the resources and capabilities that exists in the chain is often ambiguous to the wider supply network (Ozdemir et al., 2017). In addition to this, sharing of resources and capabilities occurs between partners in a dyad or triad agreements (Barroso-Méndez, Galera-Casquet, Valero-Amaro, & Nevado-Gil, 2019). For example, a manufacturer agrees to procure sustainable timber from its respective supplier, while its partner retailer wouldn't necessarily be aware of this besides the potential new green logo appearing on the packaging (Miller, Munoz, & Mallin, 2020). Therefore, in a supply network awareness on the existing resources and capabilities is not commonly known (Miller et al., 2020) . Earlier it was discussed that during restructuring of the supply network new resources and capabilities do emerge. However, identifying and then sharing the resources and capabilities requires a more coordinated process (Qiao, Choi, & Pan, 2021).

The biggest challenge in the supply network is that a significant number of resources and capabilities that exists in the chain are not used. Participants highlighted that due to the lack of coordination in the supply network abundance of resources and capabilities are unexploited in the chain. Bruno, that represented an association alluded that even the residue of products during procurement, manufacturing and end of life can be used to make other green products. However due to the lack of coordination in

the supply network, these resources are left untouched in New Zealand and often recognised by other countries like France or Australia. As an example, he mentioned that New Zealand has eucalyptus forest that are used by France and Australia for making perfume essence. However, domestic production of this is not evident. This leaves the forest farmers of the eucalyptus trees vulnerable to trade and overseas regulations. He highlighted that domestic procurement needs to identify the value of such resources to be utilised in the chain.

In continuation, Dominic mentioned that identifying and sharing the resources and capabilities existing in the chain is important for problem solving. For partners to be innovative in their solutions, they need access to each other's resources and capabilities. Dominic extended an example to this and mentioned that there is a need for green innovation in treating waste at the downstream of the supply network. He added that such green innovation might be evident in other parts of the world, but this is not shared with others although waste management and recycling is a global issue. William reflected there is an urgent need for expert green knowledge in the chain to cultivate green innovation when pursuing green issues. He faced the challenge of acquiring the expert skills and tools needed throughout the chain. He noted that pieces of green knowledge exist with each partner throughout the chain. This knowledge is an instrumental capability needed to solve green issues collaboratively.

Another critical resource identified by Khloe is the demand of customers for green products. Khloe as a manufacturer alluded that customer are an important resource to drive green production through their purchase behaviours. Khloe reflected on the main concern of the supply network being a lack of scale for green production due to reduced customer demand. Organisations then tend to be reluctant in their investments in green orientation and environmental collaboration. Khloe shared that customer demand is a significant resource to drive green productions. As a manufacturer she is then more confident in investing in green processes with partners to respond to a growing market demand.

> *"We are cautiously optimistic about the future because of the change in shift and attitude of customers. If there was a significant demand for green products then I will be more confident in starting to plan for new equipment and training more*

*people, and involving the partners."*- ***Khloe, Manufacturer, Sales & Marketing Manager***

In continuation to this, Marco, reiterated that green marketing is another resource and capability that is critical to increase customer demand. Marco as a forestry timber farmer, highlighted that he doesn't have the resources and capabilities to fund a green marketing campaign of the authentic Black Wood species of New Zealand. He noted that by coordinating a green marketing campaign throughout the supply network they can increase the demand for New Zealand timber. Marco's sentiments also allude to the need for a wider supply network collaboration that could benefit from green marketing rather than just customer facing partners reaping the benefits. Essentially utilising green marketing as a resource to build a green story that benefits all partners in the supply network is an important resource.

By contrast Isabella also shed light on the negative outcomes of identifying the resources and capabilities in the chain. She reiterated that as a global retailer trying to achieve circular economy through closer partnerships, they were able to collaborate and invest in water treatments and energy supplies. The advantage of this was the confidence and assurance they have in attaining their circular economy objectives. However, the trade-off has been the high investment costs in various countries and deviating from good partnerships that were not willing to attain the same environmental objectives. Hence, although they were able to identify plausible opportunities for collaboration, other resources and capabilities were lost.

"*It comes to cost also. Ah the risk is losing suppliers along the way. We try to get the good suppliers on board and invest or support them in changing. When we invest in mineral water, electricity, water treatment plant to change the environmental impact for our production and the whole area. Investing in the land, biofuels and feed impact the ecosystem. And that is valuable for us*."- ***Isabella, Retailer, Sustainability Developer***

Collectively participants agreed that identifying resources and capabilities helps in the coordination of environmental collaboration in many ways. Firstly, it helps partners have a lean approach to resources and capabilities existing in the chain. Secondly, it helps

partners identify resources and capabilities needed to be acquired for an easier environmental collaboration, for example expertise and people. Thirdly, partners can identify plausible opportunities for collaboration utilising complementary resources and capabilities like green marketing campaigns. Lastly, however this does come at a cost of risking plausible competitive advantage opportunities, significant costs of investment and letting go of good partnerships.

#### 5.1.2.2. Integration of Information and Knowledge

Information and knowledge that exists within the chain is one of the critical resource and capability that was identified previously (Pham & Pham, 2021). However, the integration and sharing of information and knowledge is an instrumental step partners needed to coordinate environmental collaboration (Pham & Pham, 2021). In lieu of this, the foremost point that was highlighted by participants was the lack of integration and sharing of information and knowledge throughout the network.

Francis and Farhan noted that the information and knowledge which exists is fragmented throughout the chain. Adding to this complexity they elaborated that requesting for such information and knowledge is not a common practice among partners. However, sharing information and knowledge throughout the chain is instrumental to empowering partners in their process towards attaining environmental objectives. Participants like Garret and Isabella expressed that having knowledge to attain green solutions is equivalent to having power. They stated that addressing environmental issues needs a diverse pool of information and knowledge that overlaps various disciplines. Acquiring and managing this knowledge is a critical capability needed for continuous green development and innovation.

> *"I think that knowledge is power. All our team can also recount our own experiences and what we can and can't do. And, what they're finding successful, and how we can adapt that for future customers or existing customers. So yeah, there's power in the sharing of such knowledge with our partners that helps us all take the right steps moving forward.," –* ***Garret, Logistics, Trade, and Industrial Sales Manager***

Isabella noted that acquiring sustainable knowledge empowers them to make strategic decisions against the many uncertainties that exists in the collaborative journey. Isabella mentioned that sustainable information and knowledge is the catalyst to empower partners to seek better solutions. Both Garret and Isabella highlighted that the notion of "knowledge is power" provides them with assurance when faced with evolving and multifaceted environmental issues.

Another precedent to information and knowledge integration, is the saturation of it with market leaders. Sebastian alluded to this that the furniture industry in New Zealand is manufacture led compared to retailer led in Australia. Hence, the information of market demand of green products is very much saturated within partners that lead the industry. The lack of sharing information and knowledge paired with saturation of knowledge among market leaders has impacted the supply network's coordination of sustainable knowledge for environmental collaboration.

In a contrasting perspective, Robin, and Robert where supplier and manufacturer partners that collaborated quite closely. Part of their collaboration was the continuous integration and sharing of information and knowledge about plausible green innovation and solutions that exits in the industry that they could develop together. Taking the integration, a step further both partners worked closely with their Chinese suppliers as well. Robert noted that by sharing the information about market demand and investing in the capabilities of their suppliers, they were able to work on new green products.

> ***"****We test products, and we give feedback. Robin told us about a new green product the suppliers are working on. There is a bit of back and forward, but we need to collaborate to get the innovation and solutions rolling out.,"*- ***Robert, Manufacturer, Sustainability Manager***

Comparatively, Brianna expressed a negative instance whereby the lack of knowledge sharing between her as a retailer and their manufacturer caused more environmental issues. Brianna reiterated that the plastic coverings of mattresses are often recycled during their unpacking at customer's site. They hadn't communicated this to their manufacturer. Their manufacturer then decided to reduce the environmental damage of their packaging by heat sealing the mattress bags rather than taping them. This

caused the bags to become unrecyclable and one-time use, as Brianna's installation team had no choice but to tear open the bag during unpacking of the mattresses. Brianna highlighted that sharing and integrating the information and knowledge essentially helps the industry move towards addressing common green issues facing the industry.

Brianna was a small to medium sized retailer that relied on multiple manufacturers for their merchandising. Brianna concluded that piecing together the knowledge across the chain also accelerates the green production efforts of the network. Brianna in an example noted that too many industry players glue the foam, wool, and spring in the mattress. Because of this, the mattress can't be dismantled at the end of its life for the purpose of recycling the springs. She reiterated that integrating such types of information and knowledge throughout the chain helps elevate design led green solutions.

In response to this, Edward, and Garret both highlighted that integrating such diverse information and knowledge requires communication and collaboration with various types of partners. Garret noted that his organisation proactively seeks continuous development through networking with recycling and waste management partners in forums and workshops. He echoed Brianna's sentiments, that integration of information and knowledge is needed in the supply network to solve green issues.

> "*We work closely together with other recycling partners on waste tenders. we go to the networking meetings that they have, and we contribute to waste minimisation forums and workshops for discussing green innovation*."- ***Garret, Logistics, Trade & Industrial Sales Manager***

The storing and harbouring the information and knowledge is another perspective highlighted by participants. Elijah and Frank were very proactive in actively requesting, storing, and sharing the information and knowledge throughout the chain. Their motivation was to reduce the carbon emission throughout their freight. To be able to set environmental objectives that are based on science, they used environmental management systems to record the 12-month activities of their partners in the network. Although this was faced with many challenges, including partner's lack of cooperation.

They were able to understand their current carbon footprint and then set a realistic and achievable carbon reduction target in relation to the data acquired.

In continuation to storing data, Frank added that collecting data needs to be accurate and uniform across the supply network especially with sub-contractors. He highlighted that currently, there are 42 platforms and systems that partners could use to record data if they wanted to. But these platforms don't communicate easily with each other which reduces the validity of the information. He conveyed, that government legislations can help create awareness and drive for industry players to collect, share and standardise the process of integrating information and knowledge throughout the chain.

> "It is *becoming, an area of focus for us to record our carbon emission with all our projects. Some also ask us for data, but with sub-contractors it becomes more challenging. I think it is one of the issues that our entire sector is really tackling, is finding a uniform way of being able to ask for that data, the same data in the same way, so that it is, it makes sense, it is scientifically valid. Right now, I know that we have 42 types of platforms, that needs the attention of legislators*." – ***Frank, Supplier, Carbon & Environmental Performance Manager***

Francesca continued that through integration of knowledge on the supply and demand of green products, the partners can foresee the skills needed in the future. Such training and skills will also help organisations during the downturns of the market. However, such drive needs validated facts and figures from leading players to have progressive mindset towards planning for a long-term collaborative journey. Francesca reiterated this in reference to the forest farmer's contractors that are very secluded from the information and knowledge regarding the market drivers of green products.

Warren too echoed that as a leading retailer in New Zealand, they can pool information and knowledge from both upstream and downstream partners. By actively integrating the knowledge in the value chain Warren was able to make strategic decisions. Such strategic decisions included setting targets for carbon emission, investing in energy efficiency developments and increasing green production in accordance with the scale of green demand. Finally, because of conscious integration of knowledge throughout

the chain, participants noted that the route for environmental collaboration becomes clearer. During this process they were able to also identify green issues and opportunities that have been previously overlooked.

Marco a small-scale forest farmer, noted that one of the critical reasons' environmental collaboration and green production is moving at a slow and fragmented pace through the chain is due to the lack of coordination in the integration of information and knowledge. Marco called for structure and organised integration and dissemination of information and knowledge throughout the chain to merge the many overlapping expertise and practices needed to combat environmental objectives.

> *"You need the knowledge and expertise in the concept of sustainability to apply it across all your business activities in a structured and organised way. This is urgently needed if we want to increase green production across the industry"-* ***Marco, Supplier, CEO & Marketing Manager***

In conclusion, participants highlighted many facets of integrating information and knowledge throughout the chain. Collectively the current lack of requesting and sharing of information and knowledge has led to fragmented knowledge capability, lack of accuracy, and deceleration in the adoption of environmental collaboration throughout the network. Participants highlighted many benefits of integrating the information and knowledge existing in the chain. These included identifying plausible opportunities for collaboration, collaborating towards green orientation, solutions, innovations, and developments, identifying skills and expertise needed for a long-term environmental planning, understanding the current tactics needed in response to the green supply and demand and finally the ability for customers to differentiate between organisations authenticity of green marketing claims. However as pointed out by the proactive participants in this space, integrating information and knowledge comes with many challenges including accuracy of data, resilience, and cooperation from partners, breaking the industry norm and lack of government influence in driving this critical step. Overall integrating the information and knowledge emerged as a critical step in the coordination of environmental collaboration in the supply chain.

#### 5.1.2.3. Formalising Environmental Objectives

Another approach participant highlighted that supported coordinating environmental collaboration in the supply chain is through formalising the environmental objectives. This step was one of the few that participants noted was in their immediate control and yet quite promising in outlining the objectives that needs to be attained in the collaboration. The participants reiterated that through adding environmental clause in their contracts and agreements partners become more committed to attaining environmental objectives. Conversely, without the explicit mention of environmental objectives in contracts partners treated attaining such goals as an "added-on benefit" to the existing operational collaboration. The formalisation of environmental objectives also helps clarify the expectations of participants in the role and activities needed to attain the objectives. However, as a supply network is comprised of various cross cutting industries, formalising the environmental objectives needs consideration of various environmental issues evident throughout the network.

Francesca reiterated that it is important to consider the issues facing the primary productions when the environmental objectives are being outlined. In the context of forest farmers, she noted that environmental and social objectives are just as important as material and economic imperatives. Francesca reiterated that considering the social needs of farmers such as providing consistent contracts and investing in their communities will provide farmers with more capabilities to invest in sustainable timber. Dominic agreed with Francesca and noted that in establishing environmental objectives between partners they also take into consideration the end of life of the product. As a logistic organisation, this is beyond their immediate scope of freight responsibilities. However, Dominic highlighted that by including clauses of waste management they encourage their customers to minimise the materials used for packaging and recycle the residue appropriately.

> *"Waste management its outlined in our agreements. We try to encourage them to use materials that are recyclable, minimize packaging materials, and dispose of it appropriately."*- ***Dominic, Logistics, Health, Safety and Environmental Officer***

William however, noted that by formalising the environmental objectives in agreements and contracts the partners become aware of the boundaries of practices that are not acceptable. William further expanded that the outlined environmental objectives varied from short to long terms objectives for example, outlining product ingredients, recording carbon emission, and setting future emission goals. However, he was adamant to highlight that although these objectives are formalised and evident, they are not set in stone. He reiterated that the objectives are always redeveloped and discussed to reflect the evolving nature of environmental issues.

Elijah observed another benefit of formalising environmental objectives in agreements and contracts. He reiterated that by dictating explicitly the objectives of the environmental collaboration, partners can then unify their processes and operations accordingly. This unity helps create a more accurate and seamless collaborative process that is understood by all partners. Elijah noted previously that there are a wide variety of systems used to measure environmental issues which proposes challenges of accuracy and interaction between systems. Elijah noted that by setting mutually beneficial environmental objectives partners were keener to adopt the same environmental management system to record their progress collectively.

> *"At this point our main goal is to reduce the carbon emission of our chain. We also ask our partners to use the same environmental management systems that we are accredited too. We need to accurately measure the carbon footprint of all our partners.", -**Elijah, Supplier, Marketing & Innovation Manager***

William whose partners were dispersed across different regions, emphasized that such clauses must be in accordance with the regional needs of the partners. He highlighted that through such conversations they can foresee the future and ideal level of progression they wish to achieve. However, they don't discourage their partners if they currently can't achieve the outlined objectives. On the contrary they encouraged their partners to adapt the environmental objectives to the regional concerns they are facing. They encouraged their partners to participate in a long-term journey of environmental collaboration in accordance with the local regulations.

*"We had an honest conversation and dialogue with our partners about the heighted expectation. We showed them that the global context supports this transition. But we take our suppliers on this journey, we update our specifications and practices per their regional concerns governed by their regulations. It is a continuous dialogue we have. We want to do better in our supply chain it doesn't matter where in the world it comes from.", -* ***William, Retailer, Chief Sustainable Officer***

Dominic echoed William's flexible approach and added that the purpose of formalising the environmental objectives is not to blame partners if the objectives are not attained. On the contrary, the objectives create a tangible vision that influences a clear roadmap of attaining common targets by all partners. Dominic alluded to an important notion that the collaborative process has a "trial and error" trait that by formalising the objectives the process becomes more apparent. Furthermore, the steps that are worth replicating becomes evident while the practices that didn't work can easily be identified and excluded in the future.

Isabella noted that over time, they have been able to accumulate the outcomes of different environmental contracts towards an organisation specific standard. She noted that now through years of developments the standard has become comprehensive tool that outlines environmental, economic, and social issues. Their global suppliers are empowered to adopt any of the standard they wish in accordance with regional regulations. However, she emphasized that some standards are not negotiables like using child labour. Finally, Nathan echoed Francesca's earlier concerns. He noted that not only the objectives should bear in mind the concerns of the supply network, but also be consistent to increase the green supply and production throughout the chain. Nathan like Marco noted that the furniture industry is fragmented, formalising environmental objectives with the whole supply chain in mind could be a plausible solution for industry unity.

*"I think there is a problem between people that own forests, private forest ownership and domestic processing of wood in New Zealand, they are all fragmented. Having consistent sustainable contracts help unify them and guarantee the fair price of wood."-* ***Nathan, Associations, CEO***

To conclude, one of the immediate steps' organisations can implement is formalising environmental objectives in contracts and agreements. Participants were all in favour of the many benefits they have attained through this process such as creating awareness and encouragement for partners, highlighting the success and unsuccessful steps taken throughout the process, setting flexible objectives to accommodate regional issues, and outlining explicitly the non-negotiable practices. However, such contracts and agreements are evident mostly between partners at dyad and triad relationship. Downstream players called for a supply chain integration and consideration during formalising of environmental objectives.

#### 5.1.2.4. Unifying the Green Standards

The fourth step participants highlighted was the importance of unifying the green standards. In a supply chain adopting certifications, standards, schemes, and frameworks to provide environmental benchmarks and guidelines is common practice (Bao & Zhang, 2018). Examples of such standards include the ISO Frameworks, Forest Stewardship Council, Ekos, Green Tick etc (Swarr, Cucciniello, & Cespi, 2019; Zimon et al., 2020). Participants highlighted that such standards are instrumental in creating benchmarks for green orientation. Brianna highlighted that the green certifications also help in conveying accuracy on the green ingredients used in a product. Brianna noted, that for instance when customers demand vegan mattresses, she relies on such certifications to demonstrate which product is vegan. Such information is needed to support the claims a retailer promises its customers. Elijah added that relying on the frameworks provides a roadmap as a starting point for a collaborative process. He also noted that it helps the collaborating partners to concentrate on more prevalent environmental objectives as guided by the frameworks.

> *"We started with the Carbon Reduced Certification to help us map out our carbon emissions. But we also had to ask what our suppliers and partners used to understand what they were doing to begin with. now that we have all the information, we could therefore clearly identify what our key issues were.", –* ***Elijah, Supplier, Marketing & Innovation Manager***

Dominic relied on certifications and standards to demonstrate the accuracy of their claims. He reiterated that certifications and eco logos helps remove any customer

doubts about "green washing". Dominic highlighted that this helps them to covey the brand values they believe in and practice to customers. However, comparatively some participants didn't see the value of acquiring certifications, standards, and frameworks. Francis and Farhan were one such organisation who highlighted that getting certified needs investment and continuous moderation. They both preferred to invest the capital in other impactful green initiatives rather than adding another logo to their products.

> *"We looked at one of those environmental sort of certification processes, but we really didn't want to throw whole lot of money to getting a certificate. We rather invest in green projects than add another logo."- **Francis and Farhan, Manufacturer, CEO & Marketing Manager***

Nathan agreed that a high investment is needed to get the certifications but since the industry is fragmented partners don't commonly request to see their certified practices either. Therefore, he agreed with Francis and Farhan that investing in certifications isn't necessarily too impactful since upstream partners don't request it at all. However, Frank like his partner Elijah said relying on such certifications has helped them take a lifecycle analysis of the product but there needs to be a "robust understanding" of what the certifications is outlining.

Edward shed more light on this and added that there is a wide variety of such certifications, standards, and frameworks. Hence, understanding the difference of each of them has become obscured which has caused its meaning and value to be lost for organisations and customers. Furthermore, he added that the furniture industry complements many other industries like steel, metal etc. As a manufacturer each of these require different forms of certifications, standards, and frameworks. Besides the immense investment needed to acquire these, the continuous revision and overlapping guidelines proposes its own challenges.

Khloe agreed and noted that such certifications, schemes, frameworks, and standards don't address regional issues. And due to the many challenges, it has, she has noted that often organisations try to avoid bad practices rather than proactively adopting green solutions. As an example, she noted that it is common for European organisations to invest in being accredited for not being on "The Red List" rather than proactively

investing in green operations. Edward continued that for industry players to have a robust understanding of such benchmarks, marketing and government moderation can be plausible solutions. Edward reiterated that government investment for marketing campaigns can help educate organisations and customers on the value that such certifications provide.

Elijah agreed that government moderation is needed to make sure the organisations are implementing the guidelines dictated in the certifications, standards, frameworks, and schemes. Elijah noted having eco-labels has become a "tick in a box" exercise rather than understanding the true green value it has on the final product. In reflection on the confusion that surrounds the credibility of certifications Bruno mentioned that as an association he often finds himself consulting organisations on which of the many certifications, standards, schemes, and frameworks are most compatible to each other at an operational level.

Ultimately, despite the many challenges reiterated by participants they mentioned that unifying the various standards, certifications, schemes, and frameworks helps create an overarching plan for addressing environmental issues collectively. Both Dominic and Edward agreed that unifying the standards helps create a common roadmap that can be unanimously applied by all organisations in the network. In Dominic's case, the headquarters of their organisation was based in Germany. Hence, even in New Zealand they used the same standards governed by the ISO140001 certifications. In Edwards case, as a medium sized manufacturer, he was still struggling to understand the different standards from his USA and Malaysian suppliers respectively. He noted that a global unified understanding and moderation of such schemes will help in easier marketability of green products and collaboration for supply chain partners.

> *"It is a challenge some of the timber we get from the USA who doesn't have the national standard for timber production are accredited independently by individual states. Again, Malaysia uses other sustainable programs. We need to have an international standard that is across the board to have a marketing value for commercialisation. It is also easier for us to understand with our different supply chain partners.", -* ***Edward, Manufacturer, Business Manager***

Collectively participants demonstrate mixed sentiments about the use of the many certifications, schemes, frameworks, and standards available to them. Although some did rely on them for guidelines, avoiding bad practices and conveying accurate information. They all agreed that because there are too many of them, the practices are overlapping and there is a lack of moderation during implementation, they have not been significant influencers in encouraging green production or collaboration. Therefore, a plausible solution for participants was to unify the standards used among their supply networks. They concluded that by doing this, they can help convey some accuracy and compatibility of practices which will help the coordination of environmental collaboration in the supply network.

#### 5.1.2.5. Developing Environmental Code of Conduct

The fifth step in the coordination of environmental collaboration for participants was developing environmental code of conducts (Liu, Yu, Wernick, & Chang, 2015). The participants highlighted that through the previous coordination activities an immense amount of green knowledge and expertise is earned which is valuable for the future green development of the organisation (Peng, Shen, Liao, & Wang, 2020). In most organisations such coordinating steps are managed by one department or person depending on the size of the organisation (Shafiq et al., 2020). The most common instances, the accumulated expertise is not recorded appropriately and is lost over time. Therefore, the more proactive organisations developed environmental code of conducts that is continuously evaluated. Participants highlighted that code of conduct documents are common compliance documents that exists in any form of partnership. However, environmental elements are often embedded in health and safety codes of conduct that reduces the formative and urgency nature of complying to them during collaboration with green orientated organisations (Marchi et al., 2018).

Warren specifically expressed, that the environmental code of conducts can also be used as knowledge management tools of the policies, expertise, and skills the organisation develops in pursuit of environmental collaboration. Warren reiterated that through developing environmental code of conducts, they cooperated with the procurement and merchandising department to develop guidelines on using sustainable materials,

packaging, and design. Through this process, they were able to harbour the knowledge and share it with partners for better operational and environmental practices.

> *"We have created the guidelines with the merchandising group in acquiring sustainable alternative materials, packaging materials or the design of the packaging to be more efficient and it must tick the boxes. so, it is now in the policy because a lot of the supply chain knowledge is lost. we make sure that the policies demonstrate that knowledge and share that knowledge with current and future partners.", –* ***Warren, Retailer, Sustainable Manager***

Dominic agreed and added that by developing code of conducts they can incorporate both green and social practices. Hence when presenting the code of conducts to partners Dominic realised partners became more committed to implementing them. Dominic's code of conducts also had measurement systems outlined to help the partners share compatible knowledge and information towards a unified standard. The environmental code of conducts helped increase partner's commitment and momentum for environmental collaboration. Elijah took a flexible approach and adapted the codes of conduct with each partner's current environmental needs. Elijah noted that they first relied on non-disclosure agreements to openly discuss the partners current operational activities. Protected by the assurance of confidentiality, partners felt more comfortable in having honest discussions about their current practices and the level of investment they must attain the environmental objectives. Then Elijah and his partners collaboratively elevated the practices by co- developing coded of conduct that are in accordance with each other's resources, capabilities, and concerns.

Francis and Farhan didn't have environmental codes of conduct but expressed their support for its benefits. They highlighted that although partners tend to use their products because of their FSC accreditation, due to economic reasons the environmental objectives in the contract are sometimes the first to be ignored. Hence, by reinforcing the environmental objectives in the contracts through environmental codes of conduct, partners will feel compelled to comply to the outlined standards and regulations.

*"Their designs are not always complete; the details are not always complete, but they will have statements in there that "timber must be hardwood it must be FSC" okay. Which is an environmental standard. Now that project is then put out to deliver the lowest cost price, then they going to take short cuts to eliminate FSC. The environmental code of conducts reinforces those environmental standards are not just a "tick in a box.", -* ***Francis and Farhan, Manufacturer, CEO & Marketing Manager***

In reflection to this Garret did utilise their codes of conduct to encourage other industry partners to adopt green orientation. However, he reflected on the important role of government as a collaborative partner to co-develop policies that seamlessly integrate the codes of conduct with common green concerns the industry is facing.

*"We have the code of compliance, and the good thing is we use it to influence others in the industry. If only the government would get involve making better policies and regulations based on the same codes. It will be a lot of help."-* ***Garret, Logistics, Trade & Industrial Sales Manager***

In conclusion, participants noted that developing environmental code of conducts helps record the knowledge and expertise acquired over time, dictates the changes partners must make and influences partners to proactively implement the codes. However, other benefits participants highlighted included creating a formative and constructive dialogue with partners regarding the changes required from everyone when targeting environmental objectives. The participants were also hopeful that in the long-term environmental codes of conduct will become industry norms that helps raise the industry practices. Finally, the environmental codes of conduct were most effective when design in an adaptable and flexible codes in accordance with partner's resources, capabilities, concerns, investment, and regional regulations. Overall participants reiterated that developing environmental codes of conduct is another activity that is in their immediate capability to implement in pursuit of coordinating the collaborative process.

#### 5.1.2.6. Constant Environmental Reporting

Constant environmental reporting is the sixth step that emerged in pursuit of coordinating environmental collaboration. At its core, participants all agreed that reporting is critical for continuous development and progression of the environmental collaboration. The reality of supply chains is that it is often referred to as a "black box" (Fawcett, Fawcett, Watson, & Magnan, 2012). This is an appropriate symbolism in reference to the lack of operational transparency throughout the chain (Brun et al., 2020). To this point, participants noted that having continuous environmental reporting is an instrumental activity needed for the progression of environmental collaboration.

Elijah clearly proved that in their situation because they are calculating their carbon emission, they need continuous reporting throughout the channel. This helps record a progressive schedule for establishing a timeline of when they will attain their carbon reduction goals. Mikhail added that continuous reporting needs to be established internally and externally. He noted that these practices help demonstrate to all stakeholders the steps taken in pursuit of the green objectives. It also encourages other stakeholders to join the collaboration.

> *"We have an annual report we share, as well as updates and our team newsletters get published too which have a lot of information around what initiatives we're doing around the place. And that's where I think that transparency comes in., we must show everyone we are putting the work to get the objectives done.", -* ***Mikhail, Logistics, Head of Business Development Team***

Marco reiterated that environmental reporting throughout the chain can aid channel partners in making strategic decisions in terms of increasing green production. Marco noted that as a forest owner rarely anyone requests information about the availability of domestic sustainable wood, he is happy to report this for upstream channel partners. Conversely, reporting on green customer demand and green product designing helps him make strategic decisions in terms of supplying green raw materials. Therefore, he called for further reporting throughout the chain.

> *"It would be great if we could get reports on the market flows, influences, prices. I can increase my sustainable wood production, but I don't know on the demand*

*side if customers are even asking for it. Especially with the impact of Covid we need more domestic collaboration with everyone in the industry.", -* ***Marco, Supplier, CEO & Marketing Manager***

Mikhail added that through globally recognised reporting frameworks they can outline their current environmental progress in accordance with the regional regulations. This has caused their partners in other regions to step up and strive towards environmental objectives. Through environmental reporting Mikhail reiterated that at least in their first-tier value chain the industry standards have been raised and unified. He also utilised the reports to identify the gaps in the chain that are further opportunities for collaboration. Mikhail also used the reports as supporting evidence to acquire more investment from shareholders towards environmental objectives.

Francesca noted that through environmental reporting they can identify the partner's role and contribution during environmental collaboration. She echoed Nathan's and Marco's previous sentiments on fragmentation in the supply chain. She noted through continuous reporting throughout the network the significant contribution of downstream organisations would be more evident. She also added that it will also help the downstream partners to make better strategic decisions like upskilling in reflection to the trends evident in the reports.

"We *need consistency in reports regarding supply and demand. It helps us identify where the contracts fit in the supply chain. such information can help us upskill them appropriately to the market changes*.", - **Francesca, Association, CEO**

Taking into consideration the participant's opinions, it is evident that reporting throughout the chain is not a regular practice. Yet environmental collaboration relies on accurate and credible information to be shared in the reports consistently throughout the network. Mikhail concludes that a plausible solution is the moderation of the government to implement mandated regulations for organisations to provide environmental reporting. He noted that currently, the Ministry for the Environment has proposed a voluntary reporting guideline. Mikhail positively supported this notion but

preferred a more proactive action towards mandating such reports in response to the urgency of environmental issues facing the globe.

In conclusion, environmental reporting is also an uncommon practice among supply network partners. However, participants highlighted that reporting is critical to document the progression of environmental efforts by all participants. Most considerably, the reporting is needed to capture the data and information throughout the network rather than just between agreeing partners. This helps capture a more encompassing perspective of the issues, concerns, and plausible opportunities evident in the supply chain. Overall participants noted that reporting is yet another tactic that could use government influence to encourage others in the industry to participate.

#### 5.1.2.7. Monitoring of Environmental Practices

The final step of coordinating environmental collaboration in the supply network is monitoring of environmental practices. Participants highlighted that one of the ways organisations can ensure the compliance is assured by all partners is through monitoring practices like auditing (Green et al., 2012; Salama, Luzzatto, Sianesi, & Towill, 2009). Participants reiterated the lack of government moderation has resulted in organisations forgoing the pursuit of environmental objectives. As a plausible solution Francis and Farhan noted that by having monitoring methods like audits the implementation of practices can be verified. They continued that monitoring also helps to "push" multinational organisations to invest and target their corporate social responsibilities in the hosting countries rather than only focusing on their home turfs. As an example, they noted that In New Zealand most of the industry players are from Australia. Therefore, they tend to focus on sustainable objectives and giving back to the communities of Australia rather than New Zealand. Francis and Farhan emphasised that monitoring could ensure that the outlined sustainable objectives are also applied to host countries.

Frank who was representing an Australian renowned supplier, provided a contrasting opinion to the use of monitoring practices. He noted that monitoring partners is a good tactic to shed some light and transparency on the "black box" of the supply chain. This will result in a much-needed influence and control of the collaborative process throughout the network.

*"In our supply chain with sustainability and particularly around carbon emissions, the supply chain is one of the hardest areas because you have limited control. When we can we do monitor our partners to influence them to do better. But it is very challenging.", -**Frank, Supplier, Carbon & Environmental Performance Manager***

However, monitoring has its own challenges, Frank noted that environmental monitoring is more difficult than the common practice of operational auditing which is mostly a check list exercise. The overarching challenges included evolving nature of environmental issues, influence of regional standards, inaccuracy of data, language barriers across regions and lack of green expertise and knowledge. Hence Frank highlighted that monitoring is very critical but also requires investment of other coordinating steps.

In continuation Elijah noted that monitoring environmental practices helps validate the previous coordination steps. He also uses the reports to demonstrate to shareholders the outcome of their investments. He uses the assessments from audits and other monitoring methods to demonstrate the use of $50 000 investment of the shareholders in pursuing environmental collaboration.

*"At the end of the day, we are business, and I must show my boss that the $50 000 investment he entrusted in me is making some differences. And we do that by showing them the reports and the audit assessments.", - **Elijah, Supplier, Marketing & Innovation Manager***

Warren previously noted that "sustainable skills and people" are critical resources needed in pursuit of environmental collaboration. He used the monitoring of environmental practices as an opportunity to induct and train people for further green upskilling. He continued that although they do send out employees to audit their partner's operations, they perceived this as a collaborative journey. Warren noted, through these audits they evaluate the underlying reasons partners weren't able attain the agreed upon environmental conduct. They then use this information as a training opportunity to invest further in partner's capabilities.

*"We have partners in China, India and Bangladesh is that our team members can go there and audit the factories. So that is to prioritise and to make sure that the products are moving towards quality standards and sustainability standards that we aim to be. But if they are not, we are not there to penalise them, we take it as an opportunity to influence them towards a sustainable journey. We continue training them and have regular reports on their progress."- **Warren, Retailer, Sustainable Manager***

Francesca, applauded Warren's comments on using the monitoring activity to assess potential training and upskilling opportunities. She strongly called for monitoring and auditing of standards to be used to increase training and leadership roles at the sub-contractor's level of the downstream partners in the network. She noted that small scale farmers although they have adopted green standards, don't have the skills and capabilities to develop further. This could be recognised through monitoring practices as way to raise the industry standards in the long haul. Francis and Farhan extended Francesca's points and noted that monitoring of practices should be implemented throughout the chain. They noted that throughout the supply chain activities including green designing, procurement, manufacturing, and delivery assurance of compliance to environmental standards is required.

*"It should be monitored at a chain level. We often have the challenge of influencing designers to design products that take less materials. But "So somebody will specify a 12 mm steel it could be made from 6mm steel, now we are not in the position to influence the designers. Or they can't track the product and say it is from recycled timber railway tracks from Australia. But the reality is that railway tracks aren't made of timber. But no one is monitoring this at all.", -* ***Francis and Farhan, Manufacturer, CEO & Marketing Manager***

Isabella took a broader perspective and used monitoring of practices as a tool for continuous problem solving. Isabella noted that they use surveys to gather data and information on partners practices. Then they monitor the partners progress to identify any redevelopment opportunities including investments, training, or resource expansions like technologies. This strategy of using monitoring as tool to better collaborate resonated with William and he noted that the collaborative process is not

about keeping partners in check rather it is the synchronisation of alignments towards mutual values through mentoring. Robin also took the same stance that through monitoring environmental practices a road map of progression of the collaboration emerges. He also agreed that environmental collaboration is a trial-and-error journey that is complex because of many dimensions including regulations, product specification, marketing, and customer demand. Hence, monitoring practices are instrumental for organisations to draw road maps of their successes for continuous development.

To conclude, the last step of coordinating environmental collaboration emerged as monitoring of environmental practices. Although participants did refer to this as auditing, they made a clear distinction that auditing for environmental practices is much more complex than operational auditing assessments. They reiterated that environmental issues are evolving in nature and often cross cutting across different supply chain activities in various regions. Adding to this complexity is the various government regulations, cultural and language barriers evident across the network. Therefore, participants noted that monitoring for environmental practices is less of an auditing exercise but more of ensuring continuous alignment of practices throughout the network for continuous development of the collaboration. Most importantly participants highlighted the need for monitoring practices throughout the chain rather than just between collaborative partners. They reiterated that this helps to ensure all parts of the product are compliant but also to recognize potential opportunities, trials and errors, concerns, training, and investment that is needed for more seamless coordination and collaboration in the network.

### 5.1.3 Defining Partner Roles for Environmental Collaboration

The next sub- theme that emerged in support of environmental collaboration in the supply chain was defining the partner roles. Defining partner roles for environmental collaboration is identified as outlining the role and responsibilities of partners. Supply chains are complex networks that are effective through operational and relational synchronisation (Vachon, Halley, & Beaulieu, 2009; Vachon & Klassen, 2008). Therefore, with the various capabilities existing in a chain, the roles of partners in contributing to the collaboration is distinctly unique (Merkel & Seidel, 2018). The proceeding sections

outlines the role of suppliers, manufacturers, logistics and retailers in environmental collaboration at a supply chain level.

#### 5.1.3.1. Supplier's Role

The role of suppliers in contributing to the environmental collaboration is distinctively niche (Feng et al., 2020). In this research the suppliers were Marco supplying timber, Frank and Elijah supplying steel and Robin supplying timber, plastic, and other furniture raw materials. The foremost issue all the participants echoed was the lack of sustainable raw materials in the industry. This was the foremost common issue facing the supply network. Edward shed light on this and reiterated that there is an overall lack of green suppliers sourcing sustainable raw materials.

> *"I think the network is already in place by in large okay. I think the need for people to be looking to either offer or source more environmentally friendly product or raw materials will be one of the situations and I am not sure which is the chicken or the egg.", -* ***Edward, Manufacturer, Business Manager***

The lack of sustainable raw materials proposes a "causality dilemma" because on the one hand participants wanted to increase green production while on the other hand, they have reduced availability of sustainable raw materials. Edward previously highlighted that to increase green production they also need to increase the demand of green products from customers. However, at this stage Mikhail added that the organisations have more influence to collaborate within the supply network rather than with customers. Robin agreed that the relational alignments in the chain are a catalyst for the progression of environmental collaboration. Robin noted that they were able to approach their partner Robert with innovative green ideas to test and receive feedback. Robert previously reiterated that this opportunity to collaborate with Robin has provided them with the ability to be at the forefront of green production for commercialised furniture in New Zealand.

> *"we're now working on a next generation, we are supplying them with the prototype, and they are going to do the testing for us. they are also testing more sustainable materials in classrooms for us, and we'll get that feedback and then*

*hopefully that will allow us to scale up, and that will just be the norm.", -* ***Robin, Supplier, Product Designer & Sourcing Manager***

Khloe, a domestic manufacturer was also very close to their domestic suppliers which resulted in continuous economic viability for both partnerships during the pandemic. This was a contrasting situation for other participants, who due to border closure their production reliance to international suppliers provided a myriad of challenges. Khloe also highlighted that a stable supplier collaboration provides reliability in the green production that is instrumental in response to fluctuating green demand and evolving environmental issues facing the network. Francesca noted that for example supplying sustainable wood requires 30 years of future progressive planning. To be able to invest in a long-term economic return she needed consistency in contracts from upstream partners. Francesca noted this will provide them with some assurance to invest in more sustainable raw materials while create communities surrounding the farmers. This proposes opportunities for environmental and social collaboration for upstream partners.

*"We probably again just need consistency of our contracts and consistency of supply. We can invest and plan the market progression better. Also invest in the communities for training, schools, clinics.", -* ***Francesca, Association, CEO***

Providing another spectrum of this, Marco noted that the expertise and knowledge embedded with suppliers are critical for green innovation. Marco noted that upstream partners rarely take advantage of the knowledge and expertise harboured by small-scale suppliers. Marco advocated for more integration of knowledge and information and noted that suppliers have significant contributing roles for green innovation. Green innovation requires an in-depth knowledge of raw materials that resides with suppliers. Nathan added to this from an association perspective, that the environmental collaboration with suppliers is needed urgently. He noted that the domestic sustainable timber is depreciating at an accelerated rate due to fragmentation of the primary industries, lack of government moderation and lack of supplier collaboration. Therefore, Nathan projects that by 2035 there would be a famine of wood due to the lack of planned plantations of sustainable timber since 2000's. He emphasized collaboration with upstream partners is critical for the economic viability of sustainable supply of

timber for the forest farmers. Edward further reiterated that the industry is facing specific issues that requires a collaboration with suppliers to result in industry tailored solutions. He added that collaborating with suppliers has provided opportunities to draw stories from the process. He highlighted that such green stories build the credibility and validating of green processing for them during promotion.

> *"There will be companies who will see the first mover advantage in the sustainability and greenness concept is being the aim. We have put our investments and energy into the effort to be sustainable in the long term. We are collaborating with our suppliers for industry specific sustainable solutions. But also, the stories our local suppliers have contributes to the credibility of the green story that is valuable for our marketing too.", -* ***Edward, Manufacturer, Business Manager***

In conclusion, participants all mutually agreed that supplier's role in environmental collaboration is an important starting point to secure a reliable source of green production. Participants who worked closely with their suppliers were more innovative and lead the industry. Although finding a green supplier is challenging hence collaboration opportunity to become green with suppliers is a more viable solution to address the lack of sustainable raw materials. However, despite the benefits not all suppliers had a close collaborative partnership and found themselves not being part of the decision making in the collaboration. It is worth mentioning that because suppliers at the raw material stage are considered primary industries, they were affected by other influences too. Marco shed light that despite the New Zealand government's efforts to increase certified farming but by not moderating the import of timber they are negatively impacting the economic viability of domestic procurement. Most countries that New Zealand trades with, have had evidence of illegal logging as well. Marco called for support from the government to protect the primary industries and then the need for investment from upstream partners for domestic green production with increase. Nathan added government moderations and collaboration from upstream partners with aggregate the efforts of the industry in towards a stable green supply and demand. Nathan noted that the government should provide policies and subsidies that aid in observing the price of wood. Plausible solutions like training and educational

programmes would help them to train farmers and aggregate efforts for greening the supply side of the operations. Overall, the supplier's role in the chain proved to be significant but not appreciated by all upstream partners. The coordination tactics mentioned are plausible solutions for collaboration of supplier's capabilities in the chain.

#### 5.1.3.2. Manufacturer's Role

The manufacturers' role in environmental collaboration emerged as the main influences in the collaborative process in the network. The predominant reason for the influential role manufacturers has in driving environmental collaboration is because in Australia and New Zealand the furniture industry is manufacturer led. Therefore, the role of manufacturers during the collaborative process was much more prominent compared to suppliers, logistics and retailers (Liu & Chang, 2017). Although it is worth mentioning retailers like William, Warren and Isabella also had comparable influence like manufacturers due to their scale of operation and size. The foremost role manufacturers had was the high level of influence and control in the green design of the product. Brianna especially highlighted that essentially, they sell furniture that are made to order from customers. Hence as a retailer she has no influence in the green designing of the products that she sells. Brianna's role is showcasing the range of products the manufacturer produces, and then delivers them to the customer.

> *"We deal with a group of manufacturers in New Zealand which generally made-to-order so if somebody comes to our store and orders a mattress, we then place that order to our main manufacturers which then the manufacturer within 7 to 10 working days it is then their responsibility to ship it to our store and then our store ships it from there to meet the customers.", -* ***Brianna, Retailer, CEO & Marketing Manager***

Therefore, the designing of a green product is part of the role of manufacturers. Another trait of manufacturers is that they are interconnected with primary and secondary industries. Hence, manufacturers have a foresight on a myriad of standards, certifications, schemes, and frameworks that interconnect various industries and impact the procurement and production processes. Therefore, manufacturers often bear the responsibility of unifying the green standards, synchronise the objectives, ensuring compliance and moderating the cohesion of environmental collaboration in the

network. This was emphasised by Francis and Farhan, who reflected that their position in the chain is to connect suppliers and designers has allowed them to have more influence in the coordination of collaborative behaviour for green production. They noted that as manufacturers they have the most influence to substantiate environmental objectives due to their close relationship with suppliers and designers.

> *"We have the feasibility to substantiate the chain if the suppliers give us access to this. But we can audit what suppliers are doing and then change the design and production of our products accordingly. But it must be a mutual journey from suppliers as well.", -* ***Francis and Farhan, Manufacturer, CEO & Marketing Manager.***

Garret noted that the manufacturer's role is also to take a take a lifecycle analysis when producing the products. As a logistics organisation Garret is faced with a massive amount of none- recyclable packaging. He noted that recycling is not just using recyclable materials but taking care of the hygiene and safety components. Garret noted that it is entirely the responsibility of the manufacturers to at least bear the cost of recycling the packaging. Garret added that since manufacturers have relationships with both upstream and downstream partners, they tend to harbour immense amount of green knowledge. Their role in disseminating green knowledge is also significant in coordinating environmental collaboration throughout the chain.

Frank highlighted that as a supplier they work closely with their manufacturers to adopt a lifecycle assessment of the raw materials they use. They work closely with manufacturers, installers, and customers in the steel industry to produce sustainable steel, utilise a lean installation and then collect any used steel from customers for recycling purposes. They have successfully applied this through creating close relationships with their manufacturers who introduced them to upstream partners in the chain. Milo a second-hand furniture retailer, also mentioned that he too uses his relationships with manufacturers to dismantle or recycle the furniture instead of dumping it in landfills. Milo's retail business model is based on bulk purchasing used furniture. He then refurbishes them and sells them at half price. The furniture he does possess that are can't be refurbished, he sends to manufacturer for remanufacturing.

Although, remanufacturing is a critical component to reducing waste, Brianna provided a contrasting lens to this. She acknowledged remanufacturing is an important step to achieve circular economy however the industry is facing two major challenges. Firstly, she mentioned that due to the lack of green products in the market refurbishing products will cost more to dismantle or remanufacture. Another reason the industry hasn't responded positively to remanufacturing products is the cost of dumping which is cheaper than remanufacturing. Brianna noted comparatively remanufacturing costs twice as much than dumping. However, Brianna concluded that government influence to raise the price of dumping will also influence manufacturers in producing products that are recyclable rather than relying on dumping.

> *"Dismantling products costs a lot more than dumping, unless the price of dumping changes none of the manufacturers will incur the cost for remanufacturing a product. The product must be made sustainable to begin with.", -* ***Brianna, Retailer, CEO & Marketing Manager***

Edward the manufacturer of Brianna, agreed with this statement. Edward couldn't bear the cost of remanufacturing so instead he has opted to engage with recycling and product stewardship programs. This has proven to be more effective because as a manufacturer he has in depth knowledge about the production of the product which if collaborated with the capabilities of product stewardship programs helps in recycling the products without incurring significant cost. Edward did emphasis that the many cheap imports coming to New Zealand with the high cost of labour for domestic manufacturing is another challenge that removes the economic viability for remanufacturing. Another challenge for remanufacturing was the high scale needed to make it cost effective. Robin reiterated that New Zealand market is small compared to regional neighbours like Australia. Therefore, to increase green production, significant investment and capital is needed for research and development which is not reflective of the market size of New Zealand. This is further complicated by the previously mentioned challenges of reduced availability of green suppliers and lack of government moderation of cheap imports.

> "*We need investment into materials processing. Whether that's recycling, biopolymers, alternate forestry, and board products. We need the investment for*

*R&D and then to scale up the production, materials, and processes. At the moments is just too expensive. Here in New Zealand our manufacturing is weakish, we just don't have the scale to be cost-competitive*.", - **Robin, Supplier, Product Designer & Sourcing Manager**

In conclusion, manufacturers played a critical role during environmental collaboration in the supply network. Primarily manufacturers found themselves as a catalyst to influence both upstream and downstream partners. Together with the nature of the furniture industry being manufacturer driven provided them with a diverse set of capabilities needed during environmental collaboration. Manufacturer's role included influence on product design, sourcing green procurement, partnering with product stewardship programs, green production, and remanufacturing. However, remanufacturing although a critical role for circular economy didn't seem to be the most immediate solution for participants. Participants outlined the lack of government moderation on cheap imports, high production cost in New Zealand, reduced market size and scale, and lack of green raw materials makes remanufacturing economically not viable. However, they did propose opportunities for closer collaboration with suppliers and product stewardship programs as effective solutions to increasing green production.

#### 5.1.3.3. Logistics' Role

The role of logistic organisations in environmental collaboration appeared as operationally unique to the properties of the freight industry (Rebecca Stekelorum, Laguir, Gupta, & Kumar, 2021). The logistic organisations that participated in this research were multinational corporations that were globally renowned. The foremost contribution the logistics participants provided during environmental collaboration was the use of green transportation for freight and distribution (Jazairy, von Haartman, & Björklund, 2021a). Mikhail highlighted that their main contribution is to reduce carbon emission by using electric vehicles on shorter planned routes. However, their choice of route is bound by geographical accessibility and availability of roads, seas, or rail that all have distinct differences in the amount of carbon emitted.

"*It might not be as fashionable as some of the others. We are using electric trucks, but the biggest impact ones are moving to rail, moving to sea. it has a*

*really big impact when you look at it"*- **Mikhail, Logistics, Head of Business Development Team.**

However, both Mikhail and Dominic noted that their main operational contribution to the supply chain is the safe and secure delivery of customer's goods. Hence, despite their global presence as green freight organisation, they are still bound by customers contracts that dictate the mode and route of delivery per security guidelines of the load being transported. However, Dominic did emphasise that they continuously do try to influence their customers to use green transportation, less carbon routes and to use waste management processes. However, the final decision is solely taken by customers.

Isabella's organisation is a world-renowned retailer aiming to implement circular economy. A critical component of circular economy is reverse logistics. Isabella noted that geographical barriers are the biggest challenge facing the industry in implementing reverse logistics. To this Dominic added that in some product categories like electronics the cost of reverse logistics is incurred by the customer and implemented. However, He did emphasize that this is done by their organisation in Australia which has a larger scale of refurbishing electronics compared to New Zealand.

*"Not here in New Zealand but in Australia. what we do is that I think they take back mobile phones for refurbishment for disposal for repairs. that is highly driven by the customer they wanted to pay for those operations we just run it for them. its customer demanded basically.", -* ***Dominic, Logistics, Health, Safety & Environmental Officer.***

William continued that collecting furniture materials at bulk is a challenge. Subsequently establishing refurbishment with manufacturers who are overseas needs an extensive investment. He highlighted that the structure of the industry doesn't accommodate an economically viable outcome of establishing reverse logistics. Therefore, they have approached the idea in a different manner. In their case, they have opted out to invest in numerous product stewardships programs that arrange the logistics of collecting used products for recycling. Warren noted that not owning the freight is another challenge they face in pursuit of implementing reverse logistics. Therefore, he used their capital

to invest in product stewardship programs who have the capability to visit all their retailing stores and collect used products for recycling and refurbishment.

Kyra shed light on a role they have as a logistics partner that is often underestimated. She noted that most freight organisations have access to various industries, markets, and countries. Because of this access, they can act as networking partners in the chain to connect likeminded organisations that wish to pursue environmental objectives. She reiterated that their list of customers who all want to be sustainable is extensive. Yet it rarely happens that a customer seeks network connections through their logistics partners. She reiterated, if there is more communication throughout the channel, they could be able to connect complementary partners together.

> *"But no one has asked us to connect them with other customers who want to be more sustainable too. There are opportunities for collaboration between them and we can see that across regions and industries. They can access each other through us, but we are underestimated on what we can do beyond sustainable transportation.", -* ***Kyra, Logistics, General Manager of Product & Marketing.***

Milo and Mikhail shed light on the significant influence government has on dictating the role of logistic organisations during environmental collaboration of the chain. Milo noted government incentives could help increase the economic feasibility of green business models despite him owning the freight for bulk resale of recycled goods. Mikhail highlighted the influence of government in support of investing in less carbon routes like railways and mandating carbon emission reporting is considerably important as well. Mikhail highlighted such government support could really aid them in accelerating their role of green freight in the chain.

In conclusion logistic organisations provided green transportation and using less carbon emitted routes during delivery. However, despite the popular academic literature for the implementation of reverse logistics the challenges were more restrictive. Firstly, the choice of the service is dependent on the customer to cover the cost. Hence, although the logistic participants were able to have reverse logistics for electronic products this was not evident for other product categories. Secondly, the scale and economic feasibility of reverse logistics depends considerably on the role and responsibility of

others in the supply network for remanufacturing and recycling. Thirdly, waste management, recycling and product stewardship programs proved to be more economically viable options compared to reverse logistics. Finally, one underestimated role logistics could have been connecting complementary green orientated organisations across various countries, regions, and industries.

#### 5.1.3.4. Retailer 's Role

The retailer's role in environmental collaboration included implementing green marketing, increasing customers demand, engaging with customers, and then sharing this information to other supply chain partners. These responsibilities emerged in relation to the importance of increasing green demand for green production (Yang et al., 2013). The retailer's position in the chain as an customer facing partner meant they are in the best position to take on this role (Chang, Hsu, Hsu, & Chen, 2019). Sebastian noted that New Zealand's government to ban plastic bags in 2019 was influenced by customer's call for immediate action for environmentally friendly operations. Sebastian highlighted that customer's voice has power in driving organisations and governments to react.

> *"I think the government banned plastic bags because the grounds pool of public opinion has reached a point where it was easier to ban them because most of the people wanted them banned. it was led by the consumer. we need to react to you know consumers demands."- **Sebastian, Retailer, CEO***

Brianna provided another complementary example of a New Zealand company in 2008 that produced furniture from 100% recycled Rimu timber. She highlighted that they planted and harvested the tree in expensive but purely sustainable operations. This led to the price of their bedside cabinet to cost $800. Brianna concluded that the company stopped producing because of the lack of customer demand of green products. Brianna also noted that cheap imports considerably impacted customers purchasing behaviour of furniture products. She also highlighted on the attitude- purchasing gap that as much as customers call for recycling and green operations from organisations, individually they opted out for cheaper non-green products when they are purchasing.

William added to Brianna's sentiments and noted that customer's demand for green product is not at a pace as it should be. He reiterated that currently they are seeking to understand the expectations customers have on their green operations. He noted that as retailer striving towards affordable furniture it would be contradictory to their market positioning to produce fully green products that are priced highly. Instead, they often engage with their customers to understand the expectations they have of them. Through this process they noted that customers are more inclined to know that their waste is recycled and not disposed in landfills rather than producing green products. Isabella echoed these sentiments but highlighted that as a customer facing organisation, she felt it is their responsibility to educate customers on the story behind the green products. She noted that to increase green demand they must eliminate the hesitancy customers feel during their decision making when purchasing green products.

> *"Marketing has the same effect of educating people. I mean we work with governments and groups that invest in green resources, land use, policies etc. But having a marketing campaign has a bigger impact for the supply chain. Customers need to be educated on what these changes mean for them.", -* ***Isabella, Retailer, Sustainability Developer***

Francesca although an association echoed the same sentiments and noted that a pan industry collaboration is needed to invest in green marketing campaigns. She reiterated the stories that exists within each green process is valuable in creating a credible green story needed to engage with customers. She noted that customers need to understand the impact their purchases have on sustaining green organisations in the industry.

Edward too noted that using marketing campaigns to educate customers is needed to increase demand and change negative perceptions. He reiterated that customers have many negative perceptions about the quality of a product in reflection to the country of origin it was produced. However, as supply chains are dispersed across regions this perception needs to be changed. As a manufacturer he noted that due to cost he has partners in China, but that doesn't mean the green standards or quality is forgone. However, when communicating this to customers they demonstrate doubts in the product. He added that retailers educational marketing campaigns are needed to change these negative perceptions. Edward then further highlighted that due to the

increased doubts the customers have in purchasing green products, this has led to a distrust in the organisation itself. Edward noted that it is important for retailers to invest in ways of increasing customers trust in green products. This way there would be less confusion and hesitancy in products that are green certified.

Brianna noted that it is also important to understand customers experience with current green products. She noted that unless there is more understanding of customer's experience it is not economically viable to produce products that is not embraced by customers. Hence, she mentioned that as retailers it is their responsibility to engage with customers on their experiences with using green products. Then sharing this information with supply chain partners for further development of green production. Robert a manufacturer of commercial furniture for schools reflected on the importance of storytelling in marketing for engagement and education of customers. He sees this as an opportunity to engage with the environmentally conscious students who protest for climate change emergency. He believed eventually one of these kids will start questioning the furniture and other resources they have access to and eventually these kids will be the future customers that organisation will be selling to.

> *"The biggest risk I foresee is that our customers who are kids, they're the ones that are out protesting climate action and doing experiments at school and asking questions, so I think it is a huge risk for our organisation if we don't have a story around it because at some point, I feel that an 8-year-old is going to go – Where does this come from? And if we don't have a good story around where it comes from. we might set up a mock classroom somewhere or you get kids to come in and try and teach them about where everything comes from, how it works, then that can help build the story as well with the experience of them being part of your journey, rather than just selling a product."- **Robert, Manufacturer, Sustainable Manager***

In conclusion, one of the fundamental issues in increasing the scale of green production is the inconsistency and uncertainty around customers demand of green products. Retailers appeared as fundamental catalyst to binding the green supply and demand of green products for the supply network. As a customer facing partner in the chain their role was to increase awareness and purchase behaviour of green products through

storytelling and educational marketing campaign. Post consumption duties included engaging with customers to understand their expectations and experiences with green products. Then disseminating this information and knowledge to supply chain partners for further development of green production via environmental collaboration. Elijah further closed this loop that bringing customers as partners in the environmental collaboration will provide more influencing power with industry partners to demand for better green regulations and policies from governments.

## 5.2 Industry Environmental Collaboration

In pursuit of understanding environmental collaboration in the supply chain, participants all reflected that green production requires an elevated collaboration in the industry. Therefore, the second theme that emerged was industry environmental collaboration that is defined as coordination and cooperation of supply networks at an industrial level to address environmental issues. Striving for industrial environmental collaboration is important firstly since, environmental issues are bigger than the capabilities of a supply network (Faisal, Chong, & Yee, 2019). Hence industrial environmental collaboration is needed to respond to such a global issue (Faisal et al., 2019). Secondly, the supply networks exists in multiple industries hence collaborating for environmental issues across multiple industries accelerates green production (Pratono, 2019). Therefore, the two subthemes that emerged in support of industrial environmental collaboration are competitor environmental coopetition and association's role.

Competitor environmental coopetition is defined as collaboration with competitors to address environmental issues. Some interaction and engagement with competitors in the supply network is common and well within the nature of B2B markets (Lomi & Pallotti, 2012). However, collaboration for environmental issues requires the sharing of resources, capabilities, information, and knowledge that could be perceived risking the competitive advantage of the organisation (Govindan et al., 2019). Despite this, competitor coopetition is instrumental to achieve in lieu of collaborating in the industry. Association's role is defined as the moderators of environmental collaboration in the supply chain and industry. Since monitoring is needed in the supply network participants highlighted that associations play critical role in uniting the partners. This unity can then

be elevated as a powerful voice to raise concerns of the industry to the government for co-development of environmental regulations and policies (Faisal et al., 2019). The Table 5.2. summarises the key codes of industry environmental collaboration.

| Theme | Sub-Theme | Sub-Sub Theme | Key Codes |
|---|---|---|---|
| Theme 5.2. Industry Environmental Collaboration | 5.2.1. Competitor Environmental Coopetition | | • Addressing industry specific green issues<br>• Elevating green standards in the industry<br>• Advocating for environmental collaboration to be an industry norm<br>• Unifying green standards across industries<br>• Increase economies of scale of green production<br>• Accelerating industry response to green issues |
| | 5.2.2. Associations Role | Uniting the Industry | • Uniting multiple supply network collaborations<br>• Moderating environmental collaboration between supply networks<br>• Aggregating industrial efforts to solve industrial issues<br>• Unbiased coordination of supply network collaboration<br>• Providing educational modules<br>• Providing training modules<br>• Aggregating the industry to push for policy change |
| | | Liaising with the Government | • Representative of the industry<br>• Influencing policy change for betterment of industry<br>• Highlighting industry issues that needs addressing<br>• Drawing attention to monopolies industries sectors<br>• Engagement with the government as a partner for collaboration |

Table 5:2: Key Codes of Industry Environmental Collaboration

### 5.2.1 Competitor Environmental Coopetition

Competitor environmental coopetition is defined as collaboration with competitors to address environmental issues. The furniture industry encompasses multiple primary and secondary industries (Sales-Vivó et al., 2020). Therefore, participants were quick to make this distinction that for them environmental collaboration isn't between just supply chain partners but competitors too. This is also in line with the nature of the B2B markets where competitor coopetition is a norm (Lomi & Pallotti, 2012). Sebastian highlighted that environmental collaboration occurs in a complex ecosystem with big and small players in a chain, competing in complementary and competing industries. William added that government regulations influence the pace of environmental collaboration. Taking Sebastian and Williams sentiments forward, coopetition with competitors was the foremost tactic of environmental collaboration at an industry level.

Mikhail highlighted that environmentally collaborating with competitors should be the norm of the industry. He highlighted that global warming proposes risks and challenges that is impacting everyone. Therefore, being proactive in investing in environmental solutions should be the norm of every organisation. As a logistic organisation he notes that if they don't address environmental issues their existence will be undermined due to lack of customers and market. Hence, the sustainability of organisations in the industry resonates with unity with competitors for coopetition.

> *"Global warning poses a material impact to the way we operate. We had to adjust our operations, global warming, affects the way that we distribute things. If we don't do anything in 100 years from now, we simply won't have customers, we won't have markets, we won't have trade lanes to operate in. Probably the biggest part to a degree is our voice in support of that space and uniting with competitors.,"- **Mikhail, Logistics, Head of Business Development Team***

Brianna added that working with competitors allows them to share complementary resources and capabilities that exists in the supply chain to produce industry tailored solutions. She did note that competitor coopetition at the retail sector is not part of the norm. But did mention that joining efforts with competitors allows for more investment of resources and capabilities needed to address environmental issues. Edward noted through coopetition with competitors the economies of scale of green production increases offsetting the trade-off costs associated with environmental practices. Francis and Farhan added that coopetition with competitors is like any other form of relationship alignment in the chain. They reiterated that establishing value co-creation with partners helps in establishing a mutually beneficial coopetition.

Elijah showed gratitude to his competitor's engagement for environmental collaboration. He mentioned that the steel industry is mature and has organisations that have been investing for a long time. Hence, it is very common for him to see his competitors in the environmental trade shows he visits globally in pursuit of green solutions. He was hopeful that the future for the industry is headed towards sustainable practices. Elijah collaborated closely with his competitors on green initiatives. He concluded that joining efforts at an industry level helped in achieving long term objectives that included social and community agendas.

> "*I must give kudos to my competitors in this region. I do travel around the world, and I see what we are doing here with environmental declarations, our competitors are doing the same, New Zealand and Australia in that steel market is quite mature in having these conversations. We are considerably ahead than everyone else and I think that is a good sign for the industry. It is good for the future of the industry when we join efforts, we can now target long term objectives. As an industry we have created 20 -30 pages of targets. With these new partnerships we were able to engage and give back to the community.,"*- **Elijah, Supplier, Marketing & Innovation Manager**

Dominic reiterated that through competitor coopetition they have more influence on unifying the green standards practiced in the chain. This was proposed earlier that the diverse standards, certifications, schemes, and frameworks implemented in the supply chain proposes numerous challenges. A plausible solution is the unity of industry players in unifying the green standards practiced across the network which will elevate the industry norm.

Robert highlighted that industrial environmental collaboration accelerates the response of the supply chain for environmental issues. Elijah elaborated on Robert's sentiments and noted that with competitors they were able to set up councils that target sustainable practices in the steel industry. He stated through competitor coopetition a positive precedent in the industry was set to encourage other players to become more environmentally friendly. He noted that competitor coopetition could have a domino effect to encourage industry level collaboration to have a right mindset for alignment.

> *"It has been a great journey for us working with our competitors. Together we set up the Sustainable Steel Council, this encouraged the small players to join as well. And together we are striving for a sustainable industry. All we needed was an open mind to everyone's personal sustainable journey and how we can complement each other.", -* ***Elijah, Supplier, Marketing & Innovation Manager***

In conclusion, participants reiterated that a supply chain incorporates complementary and competing industries. Hence, coopetition with competitors is the norm however this should also be extended for environmental collaboration. Primarily because

environmental issues are faced by all organisations and solving them requires unity of resources at an industrial level. Participants established competitor environmental coopetition through setting mutually valued environmental objectives that tackle industry issues, setting up councils to elevate industry practice norms and encourage the involvement of all industry players. Participants highlighted that by striving for industrial collaboration economies of scale, sharing of resources and accountability of environmental compliance can be assured. They reiterated that eventually by demonstrating "success breeds success" with competitors the industry standards will be elevated, and others will follow.

### 5.2.2 Association's Role

Participant's need for industry collaboration was evident throughout the themes. In relation to this need the role of associations as catalyst of environmental collaboration in the industry and government arose as a plausible solution. Association's role is defined as the moderators of environmental collaboration in the supply chain and industry. The role of associations involved uniting the industry and collaborating with government.

#### 5.2.2.1. Uniting the Industry

One of the main properties of a supply network is that the relationships are interconnecting in various industries across regions (Lim & Lee, 2016). Therefore, creating a collaborative network with all the stakeholders involved in the industry is a significant challenge for any organisation. Participants highlighted at most they have influence over their partners in the 1st or 2nd tier of the supply chain. Therefore, they all called for another governing body like associations to unite the partners in the supply network.

Marco noted that as a small timber supplier he knows his immediate buyers but not others. While in the overall supply network his organisation is categorised as sub-suppliers vertically placed in the 2nd or 3rd tier in the chain. For him to be able to environmentally collaborate with other members in the chain he called for regional or sub-regional unity created by associations. He noted that associations can proactively

seek organisations in the industry towards unity and facilitate the coordination of environmental collaboration.

Nathan who was an association for the forestry farmers noted that part of their work is elevating and unifying the environmental standards implemented by forest farmers. This was reiterated previously that in the fourth step in coordinating environmental collaboration in the chain is unifying the green standards. Associations as non-competitive members in the supply chain can easily assist in unifying the environmental standards in the industry. Nathan reiterated that this would remove discrepancies that exists in the compliances of practices by organisations.

> *"I help them in using the best environmental standard. They don't know which to invest or comply with. There is just too many. This way auditing and measuring the compliance of the standards also becomes easier. They all aim for the same target.", -* ***Nathan, Association, CEO***

Francis and Farhan continued this notion and raised another plausible solution the associations can execute. They noted that associations can facilitate in formalising the environmental collaboration in the industry by creating an industry wide agreement that holds organisations accountable when implementing environmental standards. Francis and Farhan, noted previously that usually due to the cost trade off, of environmental solutions the environmental standards are the first to be forgone by organisations. Therefore, they agreed with Nathan that unifying green standard is important, but associations can also create agreements among association members to help in making sure the compliance of the environmental standards are established. They conclude that this commitment to environmental collaboration will also help gain momentum for others in the industry for a small market like New Zealand.

Edward stated that through industry unity facilitated by associations transparency in operations can be achieved. Participants all agreed that the common phrase related to a supply chain as a black box is accurate. Therefore, through a non-competitive facilitator, the associations can shed some transparency on the environmental operations currently practiced. He provided an example of certifications and labelling which was previously discussed as being too many and ambiguous at an operation level.

Edward noted that associations can help in communicate the meaning of the certifications and labels which helps the industry to strive for more transparent operations. Moreover, this will also influence the customer's perceptions of these labels when they see them on timber vs Medium-density fibreboard (MDF) products.

> *"Associations can take an industry wide approach to this and saying that the goal is to have a much more green and sustainable approach to product supply in New Zealand. For example, the labels are very confusing, but I often find the same label on a timber and MDF product. These products and their productions are widely different. So, the label loses its value for the customers too. Associations can help the industry to strive for transparency in operations. We need to lay claim onto something that is meaningful.", -* ***Edward, Manufacturer, Business Manager***

Elijah agreed and added that the value of green labels and advertising is lost due to green washing occurring in the industry. Associations can help moderate false claims made by organisations. Their influence helps restore some credibility of advertising, labels and marketing campaigns that are authentically promoting green products.

Warren was one of the participants whose organisations was very active in being member of different types of associations. Some examples included the Retail New Zealand and Sustainable Business Network, which through these they have participated in numerous sustainable initiatives. Warren, therefore, was very in favour of the role of associations as a catalyst to synchronize environmental collaboration in the industry. He added that such associations can also create initiatives and product stewardship programs through their insight of the common environmental issues faced in the industry. He also concluded that associations are also critical in disseminating information on the implications of the government policies in the industry.

Bruno agreed and noted that a significant part of his daily role is to consult with association members on the impact of sustainable solutions in the value chain. He noted that the information and knowledge is overwhelming for participants and often made partners reluctant in adopting green practices due to the costs. Bruno highlighted that as an association he plays the consultant role in connecting the societal, environmental,

and economical solutions for them. He noted especially as a non-market competitor in the industry, organisations are more responsive to Bruno's knowledge of connecting the information for them. Bruno continued that besides consultation he can also coordinate educational modules for association members. These educational modules touch on a wide variety of topics. Some topics included biowaste and fuel throughout the value chain and land use. Bruno highlighted it is important to educate industry players that any type of land can be used to plant trees. The success of this depends on the type of species used.

> *"Are generally starting to require farms to have farm management plans but you need to also include the currently less-productive pieces of land like steep slopes as part of your management plan of – Why don't you manage that as another crop, as another product? Depending on the species you can put in there, you can make a range of products. We try to fill that education and knowledge gap too.",*
> - ***Bruno, Association, CEO***

Khloe who also engaged with the furniture association and noted that one of the benefits their organisation received was training for their craftsman. Khloe's organisations are renowned in New Zealand for handmade furniture manufacturing. She noted that the furniture association was very helpful in providing training courses for their workers. Brianna reiterated that the cost of dumping in New Zealand is very cheap. Hence, the economic imperative for organisation to dump waste is much more than recycling. She noted that associations can act as a unison voice of the industry to change policies that are acting as barriers for environmental collaboration.

> *"In New Zealand on average it costs about $10 per ton to dump. In Australia about $130 and in Europe $300 per ton. so, until the cost to dump in New Zealand changes there is actually very little incentive to recycle and that comes across everything. Association can use their position to change some of these policies.",*
> ***– Brianna, Retailer, CEO & Marketing Manager***

In conclusion, participants noted that associations have a catalyst role in uniting the industry for environmental collaboration. In terms of the association's perspective, they reiterated that consulting, disseminating of information and knowledge, educating,

training, and uniting the industry is part of their role. The non-competitor nature of their role allowed the industry players to be more receptive to their services. Most importantly, associations had an in-depth insight in the issues facing all tiers of the supply chain. This overview allowed them to provide initiatives that directly respond to the environmental issues and needs facing the industry.

#### 5.2.2.2. Liaising with Government

Liaising with government is the second role of associations. Francesca, Nathan, and Bruno reiterated that their non-competitive role in the supply network allows them to have a non "monopolised" intention in their influence on the wider industry. Bruno noted that his influence with government is largely dependent on the unity and scale of industry members engaging with his association. He added that ministers will be engaging with him because as an individual he represents a sector or an industry which makes collaboration with the government much easier.

> *"We need to recognise that government deals with so many things and it is about how to get attention that your thing is worth government putting time into and support it. it is a long-term gain and that's why it is important to have a strong association. I sort of excitedly tell them – Hey, there's 122 people. And why they like working through associations is that they don't want to talk to a hundred people, they'd rather talk to one person who's representing it."- **Bruno, Association, CEO***

Isabella added that by being a member of many top associations they have had the opportunity to influence European ministers on the Green Deal. She emphasised that unity and collaboration in an industry channelled through associations has resulted in influencing the mindsets of ministers in terms of accelerating the green policies drafted. Francesca noted that one of the critical roles they have is to convey the issues faced by members to the government. She highlighted that because environmental collaboration is best implemented throughout the supply chain at a macro level, they have a more complete overview of issues and concerns faced throughout the chain. Hence, she can convey the macro and micro level environmental concerns experienced throughout the chain to the government.

Nathan previously mentioned that the industry is fragmented, he added that the Forestry industry is disadvantaged in other ways. He noted that that the Ministry of Agriculture has more policies and regulations in favour of New Zealand's Dairy Industry. This investment is very damaging to the environment, but because the Dairy Industry is a significant economic contribution for New Zealand, the issues and concerns of other primary industries isn't at the Minister's forefront agenda. Nathan expressed that associations with large number of supports from the industry can use their scale to bring Forestry issues to ministers. Marco a timber supplier who was also part of Nathan's association added that due to lack of government attention and fragmented nature of the industry there is inaccuracies in the record of the forestry farmers. He reiterated that associations could play critical roles in recording such information to then convey to councils and ministers. Such records include details on land use, availability of type of trees and potential species to cultivate. Such information is critical for understanding the sustainable supply available for environmental collaboration. Hopefully, such collaboration could help influence government's awareness on forest farmers selling young trees to China which negatively influences domestic production of sustainable timber.

> *"There hasn't been any co-ordinated approach to planting and there's been very poor record-keeping by government. So, they have this thing called a National Exotic Forest Description, which is meant to be a record of what's planted in in various regions. We have collaboration with Associations to try to find out more about how many forests, types of trees and different wood is available for sustainable supply. As an association we can show the government the resources we have and regulate the export of young trees to China.", -* ***Marco, Supplier, CEO & Marketing Manager***

Dominic reflected that associations can also collaborate on drafting green standards and policies outlined by the government. He noted that association's position as a non-competitive entity can help in collaboration with ministers to regulate parts of the industry that have been monopolised. Dominic noted that parts of the recycling industry has been monopolised by industry leaders. This has caused some materials to be used for recycling, while others are diverted to landfill despite their reusable properties.

Associations can covey such issues to the councils and then collaborate on drawing policies that help demonopolize such segments of the industry.

> *"It is a very common thing that I have realized is that big players hold 60% of the market share that means they almost monopolise the market. Palettes are a good example, we used to recycle them but now they have control on this sector. We have no choice but to dump them now, because this big player has bought over the whole recycling plant. So, if an association could exist that help moderate this then the standards can also be raised.", -* ***Dominic, Logistics, Health, Safety & Environmental Officer***

Bruno noted that his long-term plan is to continue working with the government to help in the creation of biofuel regulations. Such regulations could help industry players towards converting the residue of their products to energy sources. Bruno noted that although the scientific evidence on the benefits of biofuel is evident, industry engagement is still lacking. Therefore, He reiterated that his continuous collaboration with the councils and ministers, is to help create policies that facilitate industry adoption of biofuels. Moreover, one of the primary concerns of participants was the cost trade-off of green solutions. Brianna noted that associations can also help drive government investment for incentives and funding for programs that help facilitate environmental collaboration. Brianna noted that applying funding directly from the government is very competitive, but associations can use their influence to moderate this process. Garret's organisation was a member of numerous associations ranging from freight and waste management. He reiterated that through his relationship with associations and governments they have had the opportunity to collaborate with more industries and get funding for research and development. This provided them with some assurance for setting larger targets through the associations knowing the government is supporting them.

> *"we've worked very closely with the New Zealand Green Building Council and through them we referred to many potential customers. Now, Auckland City refer people to us too. We can access some R&D fund for innovation and new ideas. Knowing the government is behind us we feel some sort of stability and security is setting better targets like a zero waste to landfill by 2040. it is the way the*

*company's moving that the government is supporting that."- **Garret, Logistics, Trade & Industrial Sales Manager***

To conclude, association's role in liaising with government proved to be a significant relational bridge of needed for industry environmental collaboration. Associations often proved important representatives of the industry which allowed them to influence regulations and policies that are more responsive to industry needs. Participants who were proactive with associations felt the frictions of government support and supply chain needs reduced. Through their respective associations they could influence the acceleration of environmental collaboration in the industry. Finally, primary industries that received less protectionism from the government had a governing body that could bring their needs to the fore front of ministers.

## 5.3 Summary of Key Findings of Environmental Collaboration

This chapter explored the key findings of environmental collaboration. Environmental collaboration emerged at a supply chain and industrial level. At a supply chain level restructuring the supply network, coordinating, and defining partner roles for environmental collaboration are the supporting sub-themes. At a supply chain perspective, the environmental collaboration needs a lean supply network structure that facilitates the synchronisation of operational and relational capabilities. The operational capabilities are the 7-step coordination, and the relational capabilities are unique partner roles evident in the supply network. These findings help organize the commitment of different partners in the supply network during environmental collaboration. Industry environmental collaboration emerged as an extension to an elevate supply chain environmental collaboration. The supporting sub-themes of environmental collaboration in the industry is through competition environmental coopetition and association's role. Industrial environmental collaboration aggregates the supply chains towards raising the green standards of the industry. Associations emerged as facilitating roles of aggregating supply networks and then communicating the needs to government to help co-develop green policies with the government that address industry challenges. Chapter 6 explores the relational factors that binds environmental collaboration in the supply network.

# Chapter 6 Findings of Relational Factors

This chapter explores the themes of relational factors that bind green organisational orientation and environmental collaboration. Relational factors are defined as the relationship characteristics that creates quality collaboration within a supply network (Touboulic & Walker, 2015). In chapter 4 the findings of green organisational orientation explained activities organisations adopt to address green issues. It was clear that the organisation is bound by its resources and capabilities before the need to collaborate with partners arises (Paulraj, Chen, & Blome, 2015). In Chapter 5 the collaboration of partners for environmental objectives was discussed at a supply chain and industry level. The findings demonstrated that the coordination steps taken by various supply network partners and the diverse roles of each partner facilitates environmental collaboration.

From the findings of green organisational orientation and environmental collaboration it is evident that collaboration is needed to mitigate the many sustainable challenges highlighted by participants. The challenges included increasing supply and demand of green products, assuring the credibility of green claims in the chain, investing in green innovation and R&D for continuous development and sharing the cost investment for green issues. To overcome such challenges participants reiterated that the relational factors that exists between partners eases the collaboration process (Wong et al., 2021). Hence, this chapter aims to address the research question:

"What are the relational factors assisting green organisational orientation and environmental collaboration to transpire between channel partners?"

A supply chain consists of a network of relationships that is dispersed across multiple tiers vertically and horizontally across regions and industries (Govindan, Shaw, et al., 2021). Hence, the environmental collaboration that occurs between the partners is unique and influenced by many macro-environmental issues (Tian et al., 2020). The themes that inductively emerged as relational factors which influence environmental collaboration throughout the network are shown in the following Figure 6.1 and explored in the proceeding sections.

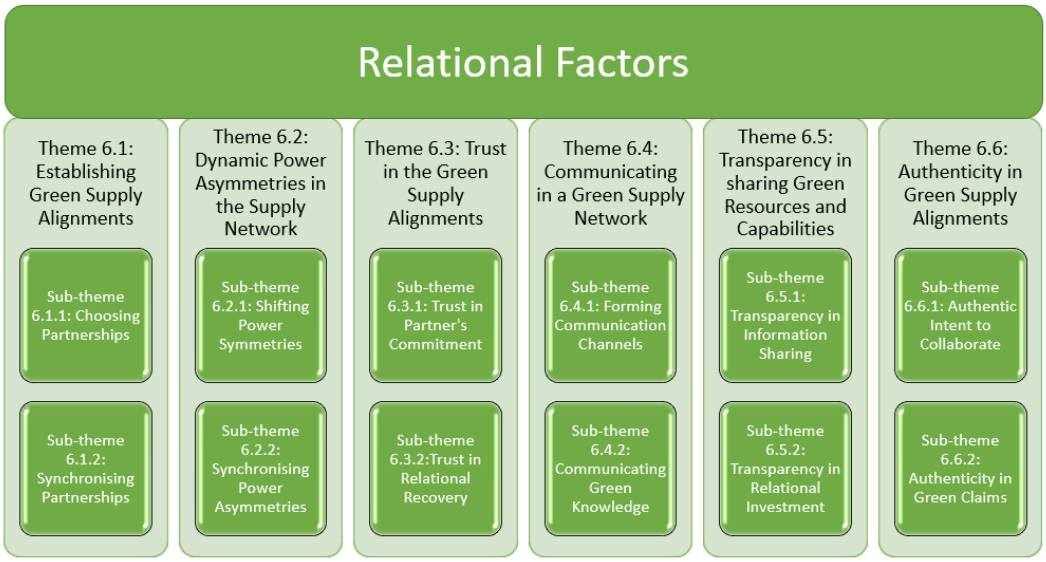


Figure 6-1: Thematic Findings of Relational Factors

## 6.1 Establishing Green Supply Alignments

Establishing green supply alignments is defined as aligning the organisation with likeminded green partnerships for environmental collaboration. Organisations must first assess the appropriate partners in the supply network that are also pursuing green issues for collaboration (Li, Shi, et al., 2020). The choice of partner for collaboration is dependent on the resources, capabilities, the relationship and the environmental objective participants want to achieve (Sadovnikova & Pujari, 2016). However, the complexity arises when the partnerships are in a network setting with many types of environmental collaborations happening concurrently (Ramanathan & Gunasekaran, 2014). Hence the myriad perspectives and relational types that make up the network impacts the quality and momentum of environmental collaboration throughout the chain (Ku, Wu, & Chen, 2015).

The two subthemes that underpin establishing green supply alignments include choosing partnerships and synchronising partnerships. Choosing partnerships is defined as selecting partners for environmental collaboration. Synchronising partnerships is defined as harmonising the efforts in the partnerships to collaborate for green issues. As previously reiterated, environmental collaboration occurs as an extension of an existing supply network collaboration. However, partners in the network may wish to pursue supply network collaboration but not for environmental objectives (Agi &

Nishant, 2017). Hence the participants must first choose from their current partnerships who wish to pursue green issues, then synchronise the partnership as to not to risk the operational collaboration that exists (Hong, Kwon, & Li, 2015). This is the preliminary phase for an organisation to initiate environmental collaboration within the supply network. The following Table 6.1. summarises the key codes of establishing green supply alignments.

| Theme | Sub-Theme | Key Codes |
|---|---|---|
| Theme 6.1.<br>Establishing Green Supply Alignments | 6.1.1.<br>Choosing Partnerships | • Choosing existing partners due to existing relational stability<br>• Choosing existing partners due to loyalty<br>• Choosing existing partners due to current operational collaboration<br>• Choosing existing partners due to existing inherit knowledge available<br>• Choosing new partners when existing partners are not interested<br>• Choosing new partners due to better practices<br>• Choosing external partners to overcome green processing challenges |
| | 6.1.2.<br>Synchronising Partnerships | • Moderations is needed to synchronise myriad collaborations<br>• Some personalisation of green issues increases commitment of partnerships<br>• Synchronising efforts by exchanging environmental, social, and economic targets<br>• Training partnerships<br>• Educating partnerships |

Table 6:1: Key Codes of Establishing Green Supply Alignments

### 6.1.1 Choosing Partnerships

Choosing partnerships is defined as selecting partners for environmental collaboration. The essence of choosing partnerships is to share resources and capabilities to achieve mutually beneficial environmental objectives. The choice of partner for environmental collaboration was varied across the participants. Some participants preferred to merge environmental objectives in their existing partnerships, while others formed new alignments. However, some participants formed alignments outside of their supply network with external organisation like associations, NGOs, and product stewardship programs. The reasons participants chose a partner for environmental collaboration is explored with special consideration that the green issue being pursued is a dominant reason influencing their partner of choice. Hence in a supply network with partnerships dispersed in multiple tiers the choice of partner was made between existing, new, and external alignments simultaneously. For example, Khloe reiterated the relationship with existing partnerships are sacred and they prefer to remain loyal to each other. Hence,

Khloe preferred to collaborate closely with existing partners in pursuit of environmental objectives before forming new alliances. Khloe's sentiments were echoed by majority of the participants.

Brianna also preferred targeting environmental objectives with existing alignments before approaching new partners. Brianna reflected that predominantly choosing existing partners over new alliances is also because they operate in the Furniture Industry. She noted that Furniture Industry is a mature industry with many organisations operating in the industry for years. Hence, the industry consists of multiple stable partnerships with years of inherit knowledge and experience. Therefore, Brianna highlighted that collaborating with existing partnerships allows them to take advantage of the embedded craft and knowledge evident in the industry. More importantly the longevity of the partnerships meant there is more influence and power during collaboration.

> *"We have strong relationships with them because it is a very stable business and there is not a lot of high turnovers of people those relationships are long term, and they are partnerships. We have more control, probably longer relationships, and perhaps more influence"- **Brianna, Retailer, CEO & Marketing Manager***

Robert however preferred collaboration with existing partners due to the already established operational collaboration. Robert as a manufacturer he had a good relationship with Robin, his supplier. Robert highlighted that with Robin they already collaborate to produce commercial furniture. However, he has increased his investment in the partnerships to include R&D which has resulted in their current wood materials to be more environmentally friendly. The development of the new sourcing material is seamless due to the existing operational collaboration with Robin.

However, the sentiments of collaborating with existing partners didn't resonate with others. Isabella's organisation is a globally renowned furniture retailer that aims to achieve circular economy. Isabella's commitment to achieving environmental objectives surpasses the need to retain non-compliance partners in their supply network. Hence Isabella noted that although throughout their transition they offered increased investment to help partners transition to higher green standards. Some existing

partnerships weren't interested in transitioning to environmentally friendly practices which caused the collaboration to cease. Although Isabella was disappointed to cease stable partnerships, she reflected that addressing environmental objectives is paramount and requires partners to comply to the changes needed.

> *"Ah the risk is losing suppliers along the way but mainly suppliers that we don't want to be associated with. we try also to get the good suppliers on board towards change. Because when we do those changes; we get them to invest or support them investing in mineral water and electricity or having a water treatment plant."- **Isabella, Retailer, Sustainability Developer***

Dominic reflected that in a supply network there are a myriad of plausible partnerships. However, the choice of partnerships is reflective of the resource and capability needed to attain the targeted environmental objective. Dominic's logistic organisation was also committed to their environmental objectives, therefore attaining their objectives surpassed the need to cherish partners that are non-compliant. However, Dominic noted that environmental objectives need betterment of current practices hence he is always open to forming new partnerships that are more environmentally driven.

Warren shared Dominic's sentiments and reflected that being open to new partnerships is required for environmental collaboration. It was previously highlighted that environmental collaboration requires integration of knowledge throughout the chain. Warren reiterated that green knowledge is dispersed throughout the organisation and the supply network. Hence, forming new alignments to cultivate the green knowledge is part of solving environmental objectives. Warren noted that forming new partnerships enriches the quality of environmental collaboration. Warren's sentiments were echoed by his manager William who added that new alignments aren't only in the supply network but also are in forms of non-competitive partnerships in the industry. William noted that product stewardship programs and NGO's can be key alliances for environmental collaboration that don't reside in the supply network. William formed many external alignments for environmental collaboration. Forming partnerships with such organisations allows them to seek advice in overcoming challenges which expedite the environmental collaboration and doesn't risk their competitive advantage as they are non-competitor entities.

*"There are also a lot of global organisations and non-for-profit organisations that act on these programs and provide industry support and supplier support so there are several civil society partners that we can engage as we go through this program, and they all play a strong role in believing in that new type of requirement. We don't do it by ourselves"- **William, Retailer, Chief Sustainability Officer***

Dominic too collaborated closely with recycling facilities for their waste products. Dominic noted that by partnering with recycling facilities they can achieve their environmental objective of reducing waste. However, at the same time by reducing their waste through recycling facilities then opportunities arise for new products to be developed such as carboards being recycled for cup holders for fast food restaurants. Although partnering with recycling facilities is at a higher cost than dumping in the landfills, the organisation's commitment to environmental objectives is very much evident. Brianna too, partnered with product stewardship programs to recycle the product at its end of life. Brianna noted that the low cost of dumping is one of the primary reasons New Zealand organisations don't engage with recycling or product stewardship programs. Brianna reflected that Australia and Europe have higher cost of dumping per ton, which drives organisations to be responsible in their waste. Hence, although she did partner with the mattress stewardship program many of the competitor organisations that had more resources don't engage with such opportunities. Hence, Brianna reflected that the economic imperative in the industry doesn't drive organisations to seek external partners for collaboration.

*"5 years ago, a company set up a mattress stewardship program called rebound. we were 100% Involved with that process. one of the things that we found quite crippling to recycling mattresses is the cost of landfill. In New Zealand on average, it costs about $10 per ton to dump. In Australia about $130 and in Europe $300 per ton. Until the cost to dump in New Zealand changes there is actually very little incentive to recycle and that comes across everything. They approached us industry wide, put only a few organisations showed up. It is just cheaper to dump than engage with programs like this.", - **Brianna Retailer, CEO & Marketing Manager***

Nathan as an association reflected that partnering with various organisations allowed him to understand the environmental issues the industry is facing. He aggregated the concerns of forest farmers into raising the industry standards in collaboration with council. As a result, they were able to influence manufacturers and retailers to source certified timber that is environmentally and socially responsible from the forest farmers of New Zealand.

Isabella concluded that choosing partners who seek the same values in environmental objectives is important to drive the momentum of environmental collaboration. She noted that by collaborating with external and supply network partners they can expedite industrial environmental collaboration. Therefore, having a united industrial influence will influence the government to support green policies and regulations.

> *"Talking about collaborations, we've just partnered up with like-minded companies. we created European Clean Trucking Alliance, and it is to work on the political, specially to advocate into the green deal to speed up the development of zero emission vehicles. I mean it is good example of how, industries and carriers, NGOs, have the power of collaboration to change the political mindset"-* ***Isabella, Retailer, Sustainability Developer***

In summary, participants reflected on three plausible partners for environmental collaboration. Firstly, by collaborating with existing supply network partners created a seamless process due to existing influence, longevity, stability, cultivating knowledge and operational collaboration. Secondly, collaborating with new partners exposed participants to new green solutions, knowledge, and joint commitment for environmental objectives. Finally, external partners proved to be instrumental in helping participants to overcome challenges, provide consultancy, aid in niche green solutions and unite the industry for environmental collaboration.

### 6.1.2 Synchronising Partnerships

Synchronising partnerships is defined as harmonising the efforts in the partnerships to collaborate for green issues. A supply network has a myriad of opportunities for collaboration with various partners (Jabbour, de Sousa Jabbour, & Sarkis, 2019). Therefore, the many partnerships in the network proposes challenges in synchronising

efforts to attain mutually beneficial environmental objectives during environmental collaboration (Cloutier, Oktaei, & Lehoux, 2019). Participants noted that collaboration throughout the network is not uniform as each green alignment has a unique commitment targeting a different environmental issue.

Warren reflected that in their retail supply network over 400 suppliers exist in China, who are dispersed vertically and horizontally across the chain. Warren reiterated that 400 plausible partnerships provide a myriad and multitude perspectives that impact environmental collaboration in the network. As a result of this, Bruno reflected that to synchronise the partnerships in the network it is important to have some form of moderation for environmental collaboration. Associations previously emerge as non-competitive industry partners that help facilitate environmental collaboration. In reflection to this Bruno continues that the need for external moderating partner increases as the number of green alignments in the network increases. Bruno's sentiments highlight the importance of moderation to facilitate the pursuit of impactful environmental objectives that resonates with all collaborating partners.

> *"Where you have got a value chain that has a lot of complexity in it, then you need more facilitation and you need more assistance, whereas the solar one is the best it is just one supplier. So that goes through for any of your value chain branches in terms of furniture products, wood products and things and all those people have conflicting drivers. there are quite several parties there to satisfy and we are very much the last pine of that at the end of that process". –* ***Bruno, Association, CEO.***

Isabella noted that personalising the collaboration for partners also invites them to become more committed to solving the green issue. Isabella previously reflected that understanding the individualised environmental issues in the chain helps them create sustainable packages. The partners are then free to adapt any of the sustainable solutions in accordance with the regional guidelines. Through this process Isabella discovered that the partners are more committed to environmental objectives since the results are regionally impactful and tailored to their concerns. Isabella realised that partners contribution to environmental collaboration throughout the network also

increases as their success is dependent on Isabella's continues investment in the green alignment.

Francesca also echoed the need for personalised environmental collaboration, as an association she was aware of the diverse concerns the forest farmers and contractors have. The common denominator was that the forest farmers and their contractors didn't have consistent contracts from upstream partners. The inconsistency in their labour demand caused a myriad of social and economic issues which proposed challenges in their continuous investment in environmental certifications, schemes, and heavy machinery. However, since their role was sub-contracted, they felt uncertainty in the return of their investments. Francesca reiterated that if upstream partners could invest in addressing the social concerns, they could easily provide consistent green raw materials. Francesca's sentiments called for an in depth understanding of partners needs that could be social and economic interest instead of just environmental. The environmental, social, and economic interests can be exchangeable for a mutually beneficial return in the collaboration process.

> *"We want them to recognise the contractor's investments and just provide the confidence that if they're investing in heavy equipment that there will be ongoing work for them. In the social scene they just need to be given good work environments, training, fair wages, build the community for their families, providing right gear and protective clothing, having updated equipment, just not just utilising them as a slave sort of mentality. If they could invest in the farmers social issues providing them with certified timber is not a big thing. The farmers already have that.,"- **Francesca, Association, CEO***

It was previously noted that integrating green knowledge is an important step for coordinating environmental collaboration. Part of this is the synchronisation of partners to proactively invest in training and educating the cultivated green knowledge to other partners. Warren previously reiterated that as a manufacturer he sees their role as a "hub" to cultivate and disseminate green knowledge. Warren added that investing in training and education is considerably important to synchronise the partnerships efforts in the collaboration. Warren reflected that the green knowledge is still in the R&D and discovery phases dispersed across the supply network. Hence, it is critical for leading

partners to take the initiative to train and teach their partners to reduce the errors and sustain the momentum of environmental collaboration.

Mikhail concluded that choosing the right partner for environmental collaboration is important but synchronising the partnerships is a continuous effort. Achieving mutually beneficial environmental objectives requires partners to integrate their resources and capabilities for the betterment of the whole supply network. Because the supply network is a consequential series of operations the efforts between partnerships does have a ripple impact on others in the chain. Therefore, to have a positive ripple impact the efforts of the partnerships should be continuously synchronised to sustain the momentum of environmental collaboration. However, in the long term the synchronising of partners becomes even more paramount because environmental collaboration needs to occur at an industrial level.

> *"It needs to be industrial across all the links in the supply chain, obviously down to the consumer because they need to be willing to pay for the steps that it takes to get there. it is hard, those integrated supply chains that some companies have set up really work well; they have got close partnerships. Others try to push their weight around a bit, and it can affect all participants along the way". –* ***Mikhail, Logistics, Head of Business Development***

To conclude, in a supply chain the opportunities for partnerships and collaboration are many due to the increasing number of alignments that exists in the network. The size of the supply chain network is reflective to the need for facilitation and moderation of environmental collaboration. The moderation and facilitation of environmental collaboration helps ensure that the needs of all partners are considered when the environmental objectives are outlined. Therefore, a critical step in synchronising the partnerships in the chain is to have a personalised environmental collaboration that focuses on objectives that are impactful for partners with respect to local guidelines. By personalising the objectives, the momentum of environmental collaboration is sustained since some concerns are exchangeable. Training and education also emerged as significant tactic to synchronise partnership efforts in reducing failures and sustaining the momentum of environmental collaboration. However, participants agreed

synchronisation of partnerships is dependent on the objective, the partner and relationship quality hence it needs a continuous investment throughout the network.

## 6.2 Dynamic Power Asymmetries in the Supply Network

Power is defined as the ability of an individual to influence another, to act in the manner that they would not have otherwise (Emerson, 1962; Talay et al., 2020). The influence partners have on each other depends on the level of dependency that exists between them (Chu et al., 2019; Frazier, 1999). The dependency of partners is proportional to the resources, capabilities and competencies invested in the partnership (Talay et al., 2020). The power dependencies in a supply network are dynamic due to the various scale, resources, and capabilities each relationship contributes to the chain (Chen, Wang, & Zhou, 2019).

Therefore, dynamic power asymmetries in the supply network are defined as the fluctuating power dependencies that exist. In a supply network the power dependencies are asymmetry and continuously changes. For example, Robin as a supplier was dependent to Robert his New Zealand manufacturer. However, he was more power independent during collaboration with his Chinese partners. Hence, the power asymmetries were dynamic and largely influenced by the position of the organisation in the network.

The two sub themes that underpin dynamic power asymmetries in the supply network is shifting and synchronising power asymmetries. Shifting power asymmetries is defined as the evolving state of power dependence and independence within a supply network. The influence of shifting power asymmetries during environmental collaboration in the network is explored. Synchronising power asymmetries is defined as coordinating power irregularities between partnerships to attain mutually beneficial environmental objectives for the supply network. Ultimately power asymmetries do influence the quality of environmental collaboration between partners (Hingley et al., 2015). However, since the supply network is made up of a myriad of partnerships the plausibility to find a partner for environmental collaboration with power symmetry is high (Hingley et al., 2015). Therefore, the dynamic power asymmetries in the supply network didn't cease environmental collaboration (Sheu, 2014). Moreover, industrial

environmental collaboration is more significant thus associations can moderate the dynamic power asymmetries that exist by uniting the industry. The Table 6.2 summaries the key codes of dynamic power asymmetries in the supply network.

| Theme | Sub-Theme | Key Codes |
|---|---|---|
| Theme 6.2. Dynamic Power Asymmetries in the Supply Network | 6.2.1. Shifting Power Asymmetries | • The role of the organisation in the supply network<br>• The position of the organisation in the supply network<br>• Pursuing stable partnerships<br>• Investing in mutually beneficial objectives |
| | 6.2.2. Synchronising Power Asymmetries | • Coopetition with competitors<br>• Industrial environmental collaboration moderates power symmetries<br>• External partnerships moderate power symmetries<br>• Value alignment strengthens the power symmetries |

Table 6:2: Key Codes of Dynamic Power Asymmetries in the Supply Network

### 6.2.1 Shifting Power Symmetries

Shifting power symmetries refers to the evolving state of power dependence and independence in the supply network. It was noted previously that the relationships in the supply network are multitiered and evolving while dispersed horizontally and vertically across different industries and regions (Hingley et al., 2015; Sheu, 2014). Hence, the embedded power asymmetry within the network shifts and fluctuates (Sheu, 2014). One of the main contributing factors of shifting power asymmetries is the market share the organisations has which reflects their influence to implement corporate social responsibilities.

Brianna a small-scale retailer mentioned that some organisations have more share in the market hence their actions have more influence in the market. She added that the increasing market share is reflective of the increasing responsibility to address the environmental objectives. Brianna alluded that most of the responsibility of investing in environmental objectives should be with organisations that have the biggest market share comparable to organisations like her with little influencing power in the market. William challenged Brianna's sentiments; and noted that they might have more power independence and influence in their market. However, environmental issues are challenging issues that impacts every organisation globally. Therefore, the influence of environmental issues is much bigger than the power independence and market share William has. William reflected that the choice of partner to collaborate is more

influential than the power influence in the market. He noted that through value alignment with the right partner, the commitment to environmental objectives surpasses shifting power asymmetry in the market.

> *"We are not a big retailer; we are a mid-size retailer in a global scale. New Zealand is a small market we play globally and the challenges we face with climate change is bigger than any one organisation to solve. The evolution of our requirements and the supplier's fit within our network strategy and organisation's strategy is more influential.,"* - ***William Retailer, Chief Sustainable Officer***

Edward a mid-sized manufacturer provided a mediating perspective to Brianna's and William's sentiments. Edward added that with more power independence and market share more opportunities for collaboration exists. He reiterated that organisations with increased market share also have more economic performance compared to others. Hence, it is based on the organisation's intent to invest in collaborative opportunities for environmental objectives rather than economic imperatives. Furthermore, Isabella agreed that as a global renowned retailer they do have more influence in various collaborative opportunities. She noted that her organisation's global influence on various supply networks, increased market share and size provides them with more power independence to have conversations with various councils and politicians. It is Isabella's good intent that such conversations are utilised towards addressing environmental objectives.

Dominic, a logistic organisation provided the darker side of using power and scale to influence environmental issues. Dominic reiterated that recycling facilities are monopolised by certain companies to control the recycling market. Previously recycling by-products and palettes was removed for free, but now there is a fee associated with recycling them. In Dominic's case, their organisation has enough resources to fund this. But comparatively not all organisations could afford the cost of recycling compared to the lower costs of dumping in landfills. Hence, such big organisations added an economical barrier for others to recycle. Rather than using their influence to make recycling more accessible throughout the supply network.

Dominic added that the organisations have taken their power independence in the recycling market a step further. He highlighted that they have used their accessibility to councils to set industry standards that dictate only a specific recycling product can be used in new products. For example, they have made it a standard that recycled wooden pallets will only be used to make playground landscaping. However, other by-products could also be utilised for playground landscaping as well. Dominic's comments echo that power has an influence in the opportunities for organisations to collaborate. However, it is in the intent of organisations to utilise this power for environmental objectives.

> *"If you start tracing it back you will say "hey the big companies are good but then the big companies are also doing things like that to monopolies the market" so for the small players there is no incentive to do recycle anymore they have no bargaining power. Cause the big companies dictate the exact type of products that could be recycled for a higher fee than dumping. And of course, they also have ties in with council to say specific grates of recycled palettes can be used in the playground only. all the supplier of waste wood and palette will have to be of a certain grate and comes only from my company because no other company is supplying that", -* ***Dominic, Logistics, Health, Safety & Environmental Officer***

Mikhail reflected on other influencing factors in shifting power asymmetries. He added that power asymmetry shifts in relation to organisations role in the supply network. For example, as a global renowned logistic organisation he has the power independence to influence his customers to use green transportations like electric vehicles. However, in the wider supply network as a freight partner he doesn't have influence on the packaging material, waste management and recycling processes post consumption. However, they do have the influence to communicate their green knowledge and expertise to any partner that is willing to implement green transportation.

Mikhail's comments resonated with Robin as well. Robin a supplier in New Zealand noticed that despite their small scale, their accessibility to New Zealand market provides them with more influencing power with overseas partners. They utilised this influence to encourage their Chinese partners to raise their green standards. While in New Zealand Robin's power is more dependent due to their reduced market share compared to competitors.

*"I think the business is of a scale that yes, it gets taken seriously enough. Our Asian suppliers, I mean they're feeling under pressure marketwise so they will do everything that they can to kind of keep the relationship positive."***– Robin, Supplier, Product Designer & Sourcing Manager**

Francis and Farhan also experienced the same shifting power asymmetry in their supply network. Francis and Farhan are mid-sized manufacturers who produce sub-products for commercial furniture. Hence, they have reducing influence on the specifications from councils, contractors and designer's when landscaping an area for commercial furniture in New Zealand. Conversely, they utilised their more influential power with their Pacific Island suppliers. They choose to procure sustainable timber from Pacific Islands for environmental and social reasons.

Robert a mid-sized manufacturer for Robin, used his close relationships between their organisations to invest in research and development. Robert as a commercial furniture manufacturer did have reduced market share in their B2B market however he did have a very close relationship with Robin as a supplier. Hence, he invested in research and development to achieve innovative green solutions for his product categories. Robert added that as a growing manufacturer they have used their influence with their close partners to synchronise research and development across Asia and New Zealand to test then produce more environmentally friendly products.

In conclusion, market share and position in the supply network impact organisations influences power during environmental collaboration. Although participants with higher power independence and market share had more collaborating opportunities with councils to set standards. However, utilising the power influence for betterment of environmental issues is based on organisation's intent. Some participants utilised their power influence in the market to raise the green standards in the industry while others monopolised the market that negatively impacted environmental issues. Participants also experienced shifting power asymmetries in relation to their role and position in the supply network. Participants noted that they might experience more influencing power in their own industries but relative to their role as suppliers or freight they have reduced power in the supply network. Taking a broader perspective addressing environmental

issues needs a united power asymmetry due to environmental challenges overpassing any one organisation's capabilities.

### 6.2.2 Synchronising Power Asymmetries

The shifting power asymmetries provided challenges and opportunities for organisations to collaborate. Although participants experienced more influence of power in some markets and supply networks, the opportunity for collaboration was not eliminated due to power dependency (Niu, Cui, & Zhang, 2018). Rather participants with power dependency also had opportunities to synchronise their efforts for collaboration. Synchronising power asymmetries is defined as coordinating power irregularities between partnerships to attain mutually beneficial environmental objectives for the supply network. Two overarching concerns impacted partner's synchronising of power asymmetries.

Firstly, Brianna mentioned that synchronisation of power asymmetry is restricted due to competition in the market. This was echoed by many of the participants that environmental issues are bigger than the capabilities of any partnership. Hence as mentioned previously environmental collaboration requires co-opetition with competitors to raise industry standards. However, participants view of green solutions as a competitive advantage in the market restricts participants commitment to cooperating with competitors in raising industry standards. Brianna noted that environmental issues are complex global problems that need coordination at an industry level. Therefore, participants reiterated to achieve an industrial environmental collaboration, synchronisation of power asymmetry must occur at a network level despite rivalry from competitors. Brianna reiterated that the industry must take a team mindset approach to addressing environmental issues facing the industry rather than a competitor mindset.

> *"And if I have something you can't have it. Instead of just let us put in the middle and we both take half each. I am saying is what needs to happen is that and all those other people we need to work together. We need to see each other as part of a team instead of the opposition."* ***– Brianna, Retailer, CEO & Marketing Manager***

Secondly, spatial distance between partners makes synchronising of power asymmetry challenging in the network. As mentioned previously, green knowledge is needed to sustain environmental collaboration in response to evolving green issues. However, the green knowledge is scattered across the supply network in various regions and industries across the globe. Participants echoed that Europe is ahead in creating sustainable knowledge through increased investment in R&D, green innovation, and pro governmental policies in facilitating adoption of green issues by businesses. Hence participants felt that synchronising power asymmetry for environmental issues is more challenging than seeking operational alliances in Oceania. Robin reflected synchronising power asymmetry with overseas partners as a singular organisation provides challenges of geographical, cultural, and linguistic barriers. Robin reflected that industrial environmental collaboration helps mediate this challenge. If synchronisation of power asymmetry occurs in the New Zealand industry, then the demand for investment in green knowledge, R&D, and innovation increases. Therefore, approaching larger markets like Europe as a united industry helps in synchronising the power asymmetry through increase scale of demand despite the small market of New Zealand.

> *"we're always looking for better materials the biggest dilemma we probably struggle with is we find the material, it is then not available to make in New Zealand- Cool, they make in Sweden, we do struggle with that tyranny of distance around materials and forming those relationships. I wonder if there's buying power that collectively New Zealand businesses could have that we could get green materials to New Zealand."*- ***Robin Supplier, Product Developer & Sourcing Manager***

As previously discussed, environmental issues are complex, therefore synchronisation of power asymmetry is best elevated industrially to resolve green issues rather than in a dyad or triad relationship. Warren mediated the competitor mindset by engaging with external organisations like associations for environmental collaboration. By having an external and non-competitive entity in the environmental collaboration, the success of the objectives became paramount to rivalry with the industry partners involved. Warren reflected that synchronising of power asymmetry in the network will also elevate the industry green standards. He noted the more players participate in environmental

collaboration; the sooner pursuing sustainable objectives will become the norm in the industry.

> *"The initiatives that we have participated had all offered convenient collaboration with our competitions. The plastic recycling initiative currently has 15 organisations participating, and that is having the scheme has contracted the business of an organisation called the Abilities Group. I believe highly that the more the merrier when it comes to sustainability. it is up to us to source products from more sustainable resources into the market and give customers the choice, instead of a just us yelling or trying to achieve an image, we look forward to having more this kind of collaboration happening within the industry."- **Warren, Retailer, Sustainable Manager***

William highlighted a personal alignment perspective to synchronising power asymmetry. William reflected that synchronisation of power asymmetry is easier when collaborating with partners that have the same value, belief, and commitment to environmental objectives. He noted that through value and cultural alignment they form a cooperative collaboration that sustains the unforeseen challenges of environmental collaboration. William previously reflected that environmental collaboration is a journey hence, he was an advocate of joining efforts to respond to environmental issues.

> *"Fundamentally it is about alignment based on values and culture is stronger than auditing and systems put in place. we hope we can achieve more symbiotic collaboration with the suppliers as part of the journey."- **William, Retailer, Chief Sustainable Officer***

In conclusion, participants reflected that power asymmetries are constantly shifting in the network. However, the challenges of environmental issues require partners to synchronise their power asymmetries to jointly contribute to environmental collaboration. Participants reflected that responding to environmental issues as a network or industrial collaboration is more impactful than through dyad or triad relationships. Although challenges of rivalry and spatial distance negatively influence the synchronisation of power asymmetries, opportunities for collaboration are still evident for participants. Firstly, participants involved non-rivalry organisations like associations

to mediate the synchronisation of power asymmetry between rivalry organisations to elevate the commitment towards environmental objectives rather than attaining competitive advantage. Secondly, by striving for industrial environmental collaboration the industrial demand and advocacy for green standards increases and synchronises efforts to create an industrial norm of pursuing green issues. Finally, participants reflected that through value alignment with partners the commitment to attaining mutually beneficial environmental objectives is elevated. They echoed that having unison value in pursuit of environmental objectives makes environmental collaboration an easier cooperative process rather than focusing on shifting power asymmetries as a barrier.

## 6.3 Trust in the Green Supply Alignments

Trust is defined as relying on partners with confidence (Sales-Vivó, Gil-Saura, & Gallarza, 2021). Trust is an intangible relational factor that intertwines with belief and faith of the partner's continual commitment to attain mutually beneficial decisions (Handfield & Bechtel, 2002). Trust can be formed at an organisational and personal level in the skills, benevolence, capability and intent of partners during collaboration (Fawcett, Jones, et al., 2012). In a supply network operational and relational alignments exist hence the trust is organisational and personally based (Ashnai, Henneberg, Naudé, & Francescucci, 2016; Li, Wang, et al., 2019). This is because partners in the supply network are aligned first and foremost to achieve an operational capability like procurement, manufacturing, delivery, or sales (Jum'a, Zimon, & Ikram, 2021). At an interpersonal relationship the continuation of the partnership could be due to the trust partners have built over time due to their operational successes (Nicholson, Compeau, & Sethi, 2001).

Trust in the green supply alignments is defined as the continual belief and faith partner's commitment to make mutually beneficial decisions when attaining green issues. In this research, both trust in the organisational and personal level is evident (Michalski et al., 2019). However, in the context of environmental objectives the trade-offs, uncertainties and evolving green issues elevates the significance of trust (Day, Fawcett, Fawcett, & Magnan, 2013). Hence participants noted that environmental collaboration with new partners is not because previous partners were not trusty worthy. Rather the new partners expressed more commitment and interest in overcoming challenges during

environmental collaboration (Hausman & Johnston, 2010). Comparatively the reverse context was also valid, whereby partner's chose to environmentally collaborate with current partners due to the already established trust between them (Xiao, Zheng, Pan, & Xie, 2010). Therefore, trust in the green supply alignments was multi-dimensional and centred not on the choice of partner but instead on partner's commitment to the environmental collaboration and relational recovery during times of failure. Trust in partner's commitment is defined as the belief and faith in partner's continual dedication to environmental collaboration. Trust in relational recovery is defined as the belief and faith in recovering the relationships during failures. The Table 6.3 summarises the key codes of trust in the green supply alignments.

| **Theme** | **Sub-Theme** | **Key Codes** |
|---|---|---|
| 6.3. Trust in the Green Supply Alignments | 6.3.1. Trust in partner's commitment | • Existing trust is evident in the commitment of partnerships for operational collaboration<br>• Trusting in partner's commitment to apply green standards<br>• Trust in partner's commitment more important than moderation<br>• Trust in partner's commitment surpasses contractual guidelines |
| | 6.3.2. Trust in Relational Recovery | • Failures in environmental collaboration is more common<br>• Gaining experience from failures is important<br>• Gaining knowledge from failures is important<br>• Sharing failures builds trust in recovery of environmental collaboration<br>• Recovery of customer's trust in green promotion is important. |

Table 6:3: Key Codes of Trust in the Green Supply Alignments

### 6.3.1 Trust in Partner's Commitment

Commitment is defined as the partner's degree of loyalty towards continual cooperation in the relational alignment (Sandra Simas Graça et al., 2021). Trust in partner's commitment is defined as the belief and faith in partner's continual dedication to environmental collaboration. Participants noted that trust in partner's commitment is largely influenced by an already existing commitment partners have shown during operational collaboration (Brown, Crosno, & Tong, 2019).

As a reflection of this, Francis and Farhan noted that before committing to new partners, they have conversations with their existing partners about extending their operational collaboration to environmental collaboration. They expressed that the existing trust in partners commitment is valuable and shouldn't be jeopardised before approaching new partners. Francis and Farhan had honest conversations with their existing partners on

the new strategic direction they wish to embark in addressing green issues. Once, the existing partners demonstrated no interest in embarking on environmental collaboration with Francis and Farhan, then they formed new alignments.

> *"First conversation I will be having with my current guys is this is where you need to be. You need to get there and have that honest discussion with them, there is no point messing with an existing valuable relationship.", -* ***Francis and Farhan Manufacturer, CEO & Marketing Manager***

Brianna too echoed the importance of organisational trust embedded in existing relationships. She reiterated that contradictory to popular belief not all exchanges are supported by certifications. Some relational exchanges are purely trust based. In an example, Brianna noted that mattresses coming from North America have fire retardant sprayed on them. This requirement does not exist in Australia and New Zealand. Hence, when procuring mattresses from North American manufacturer she trusts that they consistently provide non-fire-retardant sprayed mattress to Brianna's customers in New Zealand. Although their partners have always demonstrated their commitment to Brianna, for environmental collaboration the consequences of promoting false claims are more damaging. Hence for environmental collaboration the significance of trust in partner's commitment to implementing green standards is heightened.

Dominic agreed that trust in partner's commitment to environmental collaboration is significant. Dominic confirmed that moderation during environmental collaboration is important to ensure that partners are committed to the outlined environmental objectives. However, moderation occurs once or twice in a year, so they must trust in partner's commitment to the environmental objectives most of the time during environmental collaboration. Therefore, the organisational trust in committing to environmental objectives is significant to sustain the momentum of environmental collaboration.

Khloe reflected on trust being an important value both for upstream and downstream stakeholders. She noted that their customers are loyal to them due to their commitment to demonstrated over time on providing sustainable Kiwi made products. Their suppliers have also shown continuous commitment to providing them with sustainable Kiwi raw

materials. Khloe previously reiterated, that during the pandemic the supplier's commitment to Khloe has been paramount in their economic viability in the market. Therefore, Khloe echoed Dominic's sentiments that integrity and commitment in the relationship surpasses contractual conditions. The value of trusting in partner's commitment is also observed by customers whose needs are continuously met over time.

> *"But all the customers 50 years on they still want a new furniture they come back to X because it is trusted. You can contract yourself in and out of something but really, it is not the point. The point is, what is the personal integrity around the people that you are working with, and they are extraordinarily loyal to us. that is not something you document, that's purely relationship-based and customers understand that value within."- **Khloe, Manufacturer, Sales & Marketing Manager***

In conclusion, participants reiterated that trust in partner's commitment drives environmental collaboration. Some participants reflected that the trust and commitment in existing partnerships has influenced them to choose these partners for environmental collaboration. They felt the existing trust and commitment provides some comfort in facing the challenges of environmental collaboration. Others chose to form new alignments as the commitment needed to overcome the challenges of environmental collaboration is comparatively more significant than operational collaboration. They reiterated that avoiding making green washing claims needs honesty and integrity in committing to the green objectives and the many uncertainties of environmental collaboration. Generally, all participants agreed that trust in partner's commitment is beyond the contractual agreement and needs to be evident because moderation of environmental collaboration can't be implemented daily.

### 6.3.2 Trust in Relational Recovery

Trust in relational recovery is defined as the belief and faith in recovering the relationship during failures. Collaborating for environmental objectives is more uncertain compared to operational objectives (Aray, Veselova, Knatko, & Levchenko, 2020). This is because environmental issues are ever evolving, crosscutting, and

challenging to measure (Lusch & Spohrer, 2012). Most importantly green knowledge is continuously changing which influences the accuracy of green solutions at any point in time (Ji et al., 2020). Hence, the collaborative process is a series of trial-and-error processes. Elijah highlighted that trust in the partnership is not just having faith in the positive outcomes of the process, but also having faith in recovering the relationship after negative outcomes. Elijah stressed that knowledge and experience is gained through times of failure which positively influences future decision-making during collaboration. He noted that driving the momentum of environmental collaboration is more important that letting go of partners due to failed outcomes.

> *"Trust each other that we would be successful knowing there is a chance that we wouldn't. And that is okay, you can fail at a project if you learn something along the way it is just getting that sort of momentum."- **Elijah, Supplier, Marketing & Innovation Manager***

Warren also shared Elijah's sentiment about being forgiving for partner's mistakes in the environmental collaboration process. Warren noted that although they are a proactive retailer in New Zealand, he recognises that they are still imperfect. He highlighted that there are non-green products in the store now, but he sees the imperfections as opportunities to invest and collaborate with partners. He notes that investing in the collaboration with errors is more proactive than refusing to collaborate due to the risks. Dominic echoed the important of learning from failures. He noted it is important to gain knowledge from the failures and cooperate with partners for recovery. Dominic noted it is important to hold partners accountable and to be able to address the root cause of the failure for recovery purposes. Dominic reflected that the alignments made for environmental collaboration are valuable and shouldn't be terminated due to inevitable errors. Rather the failures are opportunities to invest in training and knowledge sharing purposes that could facilitate the momentum of environmental collaboration in the long term.

> *"We try to hold each other accountable for things and supply trainings to share our knowledge and experience. We rather invest in repairing relationships than discontinuing them. We are all learning. "- **Dominic, Logistics, Health, Safety & Environmental Officer***

Brianna reflected on the importance of recovering trust in the relationships with downstream customers. Previously participants noted that customer's increased scepticism on green promotion has negatively influenced their demand and trust in green marketing campaigns. Brianna didn't blame the customers for having doubts as the organisations that practice green washing without any accountability are many in the industry. Therefore, participants did call for moderation of green washing in the industry by associations to separate the authentic green claims from the green washing claims. However, unless this level of synchronised environmental collaboration is achieved Brianna reflected it is important to recover the relational trust of customers in their green claims. Brianna highlighted it is important to recover customer's trust in the marketing campaigns as they are the main drivers to increase demand of green production.

> "*We need more customers who are willing to join the sustainability journey. Green washing has done terrible things to customer's trust in green marketing. However, we do provide green products that are not hugely demanded, and we still get customer sceptics when we show them the certification. We need them to trust us too."*-***Brianna, Retailer, CEO & Marketing Manager***

In conclusion participants reiterated that trust in relational recovery is important to continue the momentum of environmental collaboration. The trade-offs, uncertainties, and challenges evident in environmental collaboration raises the risks of failure for everyone. Therefore, participants all echoed that trusting partners in times of failure is as important as the success stories. Participants noted that gaining experience and sharing knowledge helps recover the relationships as it increases the momentum of environmental collaboration in the long term rather than ceasing the partnership. Learning from the failures lead to plausible collaborative opportunities of training and communication that helps recover the relationship. Finally, recovering relational trust for customers is also important in driving the demand for green production. Hence, recovering relational trust is needed for both upstream and down streams collaborations.

## 6.4 Communicating in a Green Supply Network

Communication refers to the formal and informal exchange of information and knowledge between organisations (Li, Wang, et al., 2019). Communicating in a green supply network is defined as the formal and informal exchange of information and knowledge between green alignments (Paulraj, Lado, & Chen, 2008). The information and knowledge exchange should be for the benefit of environmental collaboration (Mendoza-Fong et al., 2018). Communicating meaningful information can be for report sharing purposes or informal information that strengthens the green alignment between partners (Bayne, Purchase, & Tarca, 2019). The latter being more intangible and relational based compared to the former that is more operational based.

Communicating in a network of partners is challenging depending on the relational position in the chain, infrastructure, and longevity of the partnership (Ehnert, Parsa, Roper, Wagner, & Muller-Camen, 2015). For example, communication between 10-year partnerships is much more seamless, compared to communication between 2nd or 3rd tier supply network partners that are contracted via 3rd parties (Flemming, Cress, Kimmig, Brandt, & Kimmerle, 2018). The evolving nature of green issues and cross cutting industrial and market needs in a supply network also propose challenges for seamless communication throughout the chain (Li, Wang, et al., 2019). Therefore, the two overarching sub-themes that support this theme are forming communication channels and communicating green knowledge.

Forming communication channels is defined as the creation of channels or mediums that aid in meaningful exchange of information and knowledge. Previously participants noted that the tiers in the supply network are fragmented. Hence forming communication channel aims to aggregate the tiers in the supply network to facilitate the sharing of information and knowledge for environmental collaboration. Communicating green knowledge is defined as sharing information and knowledge about green issues. The purpose of communicating green knowledge is to cultivate, harbour and share green knowledge to increase the momentum of environmental collaboration in the supply network (Kurschilgen & Marcin, 2019). Communicating in a green supply network is a critical coordination step needed for integrating knowledge for environmental collaboration. Through communicating in the green supply network, environmental

collaboration can be expedited towards green production. The Table 6.4 summarises the key codes in support of communicating in a green supply network.

| Theme | Sub-Theme | Key Codes |
|---|---|---|
| Theme 6.4. Communicating in a Green Supply Network | 6.4.1. Forming Communication Channels | • Harbouring knowledge through communication channels<br>• Recording partner's concerns<br>• Accuracy of decision making with right information<br>• Moderating non-compliant partners<br>• Amending environmental targets<br>• Amending environmental guidelines |
| | 6.4.2. Communicating Green Knowledge | • Fostering expertise for green knowledge<br>• Fostering capabilities for green knowledge<br>• Sharing green knowledge through training, webinars, YouTube Videos, newsletters, and workshops. |

Table 6:4: Key Codes of Communicating in a Green Supply Network

### 6.4.1 Forming Communication Channels

Forming communication channels is defined as the creation of channels or mediums that aid in meaningful exchange of information and knowledge. The perception of meaningful information varies for participants depending on their alignment and objective at hand (Kurschilgen & Marcin, 2019). Frank alluded to this stating that, to set environmental objectives, they must have accurate information and data on their current emission and environmental status. Realistically, it is hard to measure environmental status, but Frank had mentioned previously the use of environmental calculators. He adds here that by dividing the emission into categories of scope 1 as direct, scope 2 as indirect (electricity) and scope 3 as supply chain, they can identify the sources to get these data from. For instance, the scope 1 emission is calculated through internal communication of employee's mode of transport and organisational operations. The emission data for scope 2 is gathered through power bills, and scope 3 information is gathered from supply chain members. He notes that software's are used to gather such information to calculate the data in creating meaning full information and synchronising the data gathering process across channel partners. Although the data entry and accuracy of scope 3 provides some challenges, Frank was very happy that at least communicating meaningful data is easier through the software. The software allowed participants to communicate information in real time.

Isabella a global retailer with many dispersed partners used multiple methods to collect, compile and disseminate meaningful information throughout their network. Firstly, by

using software's like Frank they create communication channels throughout all their partnerships across multiple tiers of their supply network. The software's record various data and information to keep everyone up to date with the diverse initiatives and projects that are undertaken across the chain. Secondly, they use surveys to understand the concerns of each stakeholder to constantly update their objectives. The surveys are important to reflect on as an information exchange tool across the chain. Understanding the concerns of different partners helps Isabella tailor objectives to regional needs. Thirdly with the information acquired through the software's, surveys, and audits they create compliance policies and regulations. The last steps allow them to harbour the information to create knowledge.

Isabella mentioned that by taking into consideration all stakeholders concern in every region, the compliance standards are compatible with regionally regulations. Although all partners have access to all the information, they may choose the polices and standards best fits their capabilities to implement. Isabelle noted that structuring their communication medium in this way has allowed for meaningful dissemination of information and knowledge be distributed at a global platform among all partners. Through these tools Isabella's organisation can have an in depth understanding of concerns in the value chain and the plausible opportunities for more environmental collaboration. Isabella concluded that they also use this information to identify non complaint suppliers. This helps them identify suppliers who need more relational investment in adjusting to new standards. To reinforce this information, they continue conducting webinars and distribute yearly catalogues globally.

> "*We work in many ways. First, we have our ah I-Way standard, it tackles not only environment, social and economic issues are also covered. It is a compliance with some mandatory laws like child labour and some regional guidelines. This comes from the compliance team through our audits from direct and indirect suppliers, it goes throughout the value chain, ok. We also have a yearly environmental survey; we collect a lot of data in this survey but not heavy. In this survey we capture a few efficiencies, projects in the pipeline, calculate our* $CO_2$ *emissions: map initiatives and projects. In Europe people are working more with EV and hydrogen, for example. And in other parts of the globe, they are pushing more*

*for different technologies. So, we start to understand the markets because of that, and we try to partner if we can with some of our suppliers to join them in the journey. We capture in the survey hubs of where people are not doing certain things, idling policies etc. So those things we can work together with our suppliers to develop. And we also create webinars and provide feedback for future developments that we can collaborate. Then we also do a lot of these knowledge-sharing sessions where we catalogue the good examples, and we share with our partners."- **Isabella, Retailer, Sustainability Developer***

Warren too reiterated their role as information hubs in the value chain. As a large-scale retailer with over 400 partners, he realised they have immense amount of information and knowledge that is useful for environmental collaboration. For example, their information on customer demand of green products helps fuel the investment of green production in their supply network. They are currently investing in forming communication channels across the chain. Warren noted that especially in the context of reporting carbon emission and energy usage creating communication channels across the chain has allowed them to make better strategic decisions in cooperation with partners. William added that by establishing themselves as hubs they create an ongoing dialogue with suppliers on raising standards. Like Isabella, this will then feed into the constant upgrading of sourcing practices and policies. However, he does highlight that a fair bit of negotiations does occur in these dialogues to fully understand the trade-off each partner experiences in exchange for raising their standards. Finally, concluding that such dialogues are continuous conversations in response to the evolving environmental issues and trade-offs in each region.

*"It is part of our ongoing dialogue with them in supporting that transition. therefore, as an organisation just keep on upgrading and updating our sourcing practice and our policies. There is also a fair amount of trade-off that we must do in some of these dimensions. There is a bunch of trade-offs that we are just starting to uncover so again, it is a journey, it is a conversation. What we do is because we work hand in hand with our suppliers it is by the dialogue, we have with them on a regular basis". **– William, Retailer, Chief Sustainable Officer***

Mikhail echoed the need to form communication channels to understand the concerns of partners. Mikhail's organisation conducts materiality assessment that helps them understand the emission and activities their partners are dealing with. The materiality assessment also allows for open and honest communication regarding partner's concerns. Because the information is readily available to everyone the challenges the partners are facing is also evident in the data. Mikhail uses these records to invest in their partner's capabilities and identify further opportunities for environmental collaboration. The open and honest conversations stemming from the data allows alignments to pursue environmental objectives that are realistic, measurable, and impactful for all stakeholders.

Mikhail, Isabella, William, and Warren demonstrated exemplary experiences of creating communication channels. However, it is worth mentioning that all three organisations are relatively large enterprises that have the resources to invest in forming communication channels, comparatively this is not the reality for other participants. Brianna noted that as a small to medium sized retailer her communication with manufacturer Edward and other suppliers is very informal based. The informal and purely relational based communication impacts the quality of information and knowledge being shared. The lack of formal communication channels results in a slower environmental collaboration and reflects on the reduced commitment to attain the environmental objectives.

> *"I would meet with them monthly. It is usually a casual commercial talk about market and its influences. Maybe that's part of the problem we do not have dialogue about environmental objectives as much.", -* ***Brianna, Retailer, CEO & Marketing Manager***

Khloe echoed the sentiments of lack of communication across the chain. Khloe's organisations relied heavily on one of the two CEOs to share information on their partners in the chain. Khloe noted that relying one colleague's memory is not durable but also, they don't have an in-depth knowledge on the different resources and capabilities that are evident in their supply network. The lack of information on partner's has influenced their ability to environmentally collaborate due to reduced clarity on the roles evident in the network. Francesca concluded that communication channels are

needed to record and understand the concerns, issues, and information each partner has. Such information should be measured and moderated to increase the momentum of environmental collaboration. Francesca echoed William's sentiments that environmental collaboration needs continuous dialogue to address the evolving green issues.

In conclusion, forming communication channels proved to be a facilitator to increase the adoption of environmental collaboration throughout the chain. Participants who could invest in the infrastructure of forming communication channels benefited from making better strategic decisions based on real time information recorded by partners. The channels provided insightful information on concerns, issues and knowledge that exists across the chain. Disseminating meaningful information across the chain provided more opportunities for environmental collaboration. Most importantly participants used the information for developing their policies and compliances for further growth. However, not all participants had communication channels rather the information was shared informally through personal relationships. The lack of communication channels meant reduced clarity and understanding of partner's resources, capabilities, and knowledge which negatively influenced the momentum of environmental collaboration. Partners also experienced reduced commitment to attaining environmental objectives since the information was shared informally. However, all participants agreed that communication channels are needed to facilitate the ongoing conversations of addressing evolving green issues across the chain.

### 6.4.2 Communicating Green Knowledge

Communicating green knowledge is defined as sharing information and knowledge about green issues. As observed previously forming communication channels to disseminate information is critical to increase the momentum of environmental collaboration. A critical component of one such information is communicating green knowledge. It was previously noted that organisations need green knowledge to create green solution in response to evolving green issues (Mendoza-Fong et al., 2018). During the coordination of environmental collaboration, participants noted integrating knowledge as a critical step in cooperatively attaining environmental objectives. Hence as a relational factor communicating green knowledge emerged as a catalyst of aligning

partners towards efficient environmental collaboration. Communicating green knowledge through the supply network develops the necessary expertise needed to solve green issues over time.

The foremost knowledge participants could cultivate for communication was the green knowledge evident in the organisation. Internally the organisation is made up of various departments and expertise. Each employee is an expert in the knowledge of making their daily role more environmentally friendly. Moreover, participants previously highlighted that their younger employees tend to be more environmentally conscious. Hence, Francis and Farhan highlighted that it was important to cultivate the green knowledge evident in the organisation then communicate this via newsletters or workshops. By communicating green knowledge Francis and Farhan found it easier for the organisation to be accepting of environmental collaboration as the momentum builds internally first. The employees also felt they are part of attaining environmental objectives despite their role in the organisation.

> "*We first approached our own team. They know the ins and outs of their role and how it can be more sustainable. We gathered all that information then started having workshops for everyone else. There were so many things we found out we could do better once we had these conversations. We also put it in our monthly newsletters.", -* ***Francis and Farhan, Manufacturer, CEO & Marketing Manager***

Garret previously noted that cultivating knowledge is empowering to strive for green issues. The knowledge that is cultivated is continuously shared throughout the organisation via meetings and videos. Garret's organisation had an impressive collection of success and failure stories they shared on their websites. The YouTube videos demonstrated better methods in their processes. They used these resources to build green knowledge internally as well as externally with customers. Garret too felt that green knowledge is critical in building the expertise and skills needed for environmental collaboration. Previously Elijah reflected that environmental collaboration is a path full of trials and errors. He reflected a critical component is to continue trusting in the alignments but also learning from the errors. Elijah reiterated that communicating the failures helps build green knowledge on not replicating the same mistakes.

Nathan demonstrated a great example of when green knowledge has made the environmental collaboration better. Nathan, as a farm forestry association, noted that they have immense amount of knowledge in terms of farming for sustainable wood based on tree species. Since the information is fragmented throughout the chain the upstream partners or councils rarely request for such knowledge. Therefore, Nathan's association also provided numerous webinars and workshops on their website to educate their audiences on farming and using sustainable woods.

> *"95% of trees planted by small-scale forest owners and the big corporates are Radiata Pine, but the small-scale forest owners are interested in alternative species that are better and perform the same as pine. Unfortunately, local authorities and buyers do not recognise alternative species. No one listens to their suggestions; a farmer has been planting trees for 40 years. He knows his stuff. But no one talks to them. So, what we do is put all that information on our website to whoever would listen.,"- **Nathan, Association, CEO***

Reflecting on Nathan's comments the importance of communicating green knowledge throughout the supply chain and industry to governments. By communicating the green knowledge evident across the supply chains and industries associations, can build a convincing dialogue to attract the attention of governments. Previously Bruno reiterated that part of his role is to be an industry representative in co-developing regulations with councils. Like Nathan, he communicates the green knowledge from the supply network and the wider industries through educational videos and documents on his website. Then he communicates the harboured green knowledge to councils to help develop regulations and policies that address green issues facing the industry.

However, communicating green knowledge is quite challenging for participants. Firstly, green knowledge is multifaceted and involves cultivating information from various disciplines. Secondly, green knowledge is fragmented throughout the supply network, hence it is important to create communication channels to facilitate the sharing of green knowledge. However, this requires investment and using mutual software's to disseminate the green knowledge as mentioned previously. Thirdly, the green knowledge is a resource that could be a competitive advantage.

Robin echoed that green knowledge builds expertise and skills needed to overcome the challenges of environmental collaboration. However, green knowledge is also considered an intellectual property that could be a competitive advantage for the organisation itself. Hence, some organisations communicate their green knowledge for the betterment of addressing green issues, while others protect it for confidentiality reasons.

> *"Most of us are struggling to be sustainability experts in it. We find that some people are holding that intellectual property close to their chest, but most likeminded people are happy to have the conversation though."- **Robin, Supplier, Product Designer & Sourcing Manager***

Therefore, Isabella's sentiments conclude that communicating green knowledge is in early stages and the method of sharing it depends on the partner and type of alignment. Communicating internally is the easiest form of disseminating knowledge, while external communication needs infrastructure. Nevertheless, as previously noted customers are also important partners in increasing the demand for green production. Hence, she notes that using educational marketing campaigns are important to communicate green knowledge to customers and influence their behavioural purchase decisions beyond their current level of green awareness. However, communicating green knowledge is best done in incremental steps for all stakeholders as the adoption and adjustment needed takes times.

To conclude communicating green knowledge is important to build expertise and skills in response to green issues. Firstly, cultivating and then communicating green knowledge in the organisation empowers employee's role in the environmental collaboration. Although the easiest form of communicating green knowledge is internally but coordinating the organisation requires involvement of everyone. Secondly, communicating green knowledge throughout the supply network requires educational materials, infrastructure and forming communication channels. However, overcoming these challenges increases the commitment of partners to solve green issues. Thirdly, communicating green knowledge from a supply chain and industry perspective to government is needed to help develop regulations that address industrial issues. Associations play a critical role in communicating green knowledge both from

supply chains to industries and then from industries to councils. Finally communicating green knowledge is in preliminary stages and requires time to be adopted by all stakeholders.

## 6.5 Transparency in Sharing Green Resources and Capabilities

Transparency in sharing green resources and capabilities is defined as the accessibility and openness of partners in sharing their resources and capabilities for environmental collaboration (Brun et al., 2020; Yang & Battocchio, 2020). Participants reiterated that environmental collaboration needs complete accessibility and openness of stakeholders in the green resources and capabilities available for environmental collaboration (Zhu, Song, et al., 2018). Essentially, the resources and capabilities existing in the supply network are many, however, the partners might not be willing to share everything for the sake of pursuing green issues (Brun et al., 2020). Therefore, transparently sharing the exact green resources and capabilities evident in the supply network for environmental collaboration is important (Goswami et al., 2011). The two sub-themes that underpin this theme are transparency in information sharing and transparency in relational investment.

Transparency in information sharing is defined as the openness and accessibility of sharing quality information in the supply network. This is in line with the need to integrate knowledge, cultivate green knowledge and then communicate green knowledge throughout the supply network (Zhu, Song, et al., 2018). However, it is important for this information to be shared in an open and accessible manner throughout the supply network (Brun et al., 2020). The further development of environmental collaboration relies on the transparent sharing of quality information(Brun et al., 2020).

Transparency in relational investment is defined as the partner's openness to the degree of commitment to environmental collaboration. This subtheme is relational based and surpasses the trust in partner's commitment rather their openness in the magnitude of commitment to environmental collaboration. As mentioned previously environmental collaboration occurs as an extension of an already existing operational collaboration. Therefore, although partners might be well aligned for pursuing green issues they might

not commit to environmental collaboration in the same extent. The level of commitment to environmental collaboration should be transparently conveyed among supply networks to set accurate expectations during environmental collaboration. Therefore, transparency in sharing green resources and capacities has an operational and relational perspective that provides openness and accessibility to partners for environmental collaboration. The Table 6.5 summarises the key codes of this theme.

| **Theme** | **Sub-Theme** | **Key Codes** |
|---|---|---|
| Theme 6.5. Transparency in sharing green resources and capabilities | 6.5.1. Transparency in information sharing | • Using Non-Disclosure agreements for confidentiality of information<br>• Establishing open and honest conversations<br>• better co-development of policies with government<br>• Relying on global schemes to record, track and report information<br>• Validating green claims |
| | 6.5.2. Transparency in relational investment | • Open conversation on level of investment for green issues<br>• Open conversation on the significance of green issue<br>• Open conversations about non-negotiable practices<br>• Open conversation in degree of commitment to supply network versus industrial collaboration |

Table 6:5: Key Codes of Transparency in Sharing Green Resources and Capabilities

### 6.5.1 Transparency in Information Sharing

Transparency in information sharing is defined as the openness and accessibility of sharing quality information in the supply network. Previously the importance of acquiring green knowledge for environmental collaboration was highlighted. In the preceding theme the significance of forming communication channels for disseminating information was also discussed. In the sub- theme of transparency in information sharing participants reiterated the importance of openness and accessibility to each other's information. For example, Elijah noted that requesting partners to sign a one-page Non-Disclosure Agreement (NDA), creates an open disclosure of information among collaborating partners. Elijah expressed that by securing the confidentiality of the information being shared it allows participants to have an honest discussion of partners concerns and contribution to the environmental collaboration.

> *"I have been really impressed with our partners, for example once an NDA for a project is signed it opens the conversation even more as opposed to having 3 or 4 meetings where people are talking around the project. The conversation is more*

*honest about what we can contribute knowing it is confidential"- **Elijah, Supplier, Marketing & Innovation Manager***

Francesca agreed that openness and honesty is also needed at an industrial environmental collaboration level. She noted that transparency in information with councils helps in co-developing regulations and legislations that raises the environmental standards of the industry. She is currently drafting a contractor's certification scheme that highlights the importance of increasing social wellbeing of farmers. She highlighted that addressing the social issues will allow for a higher economic wellbeing which results in contractors being able to invest further in environmental standards. She noted that elevating environmental standards across the industry requires openness of information sharing to be accessible across the chain.

Frank added that by using global accredited schemes and frameworks throughout the chain, the information shared between partners becomes open and accessible. Previously Frank and Elijah noted that they want to reduce the carbon emission in their supply network. Hence, they have introduced international environmental systems to track, record and report the carbon emission of partners. Frank highlighted that by using internationally accredited schemes the information shared becomes transparent and accessible to all partners. A benefit they have acquired is that since all partners base their decision on an open available information their expectation in the environmental collaboration is also synchronised.

*"The solution is to keep yourself and the partners accredited to an environmental management system where you can put the data out in a format that everybody answers to. All our partners make decisions based on the same information. The alignment is better because the information is accessible to everyone and the expectations are set."– **Frank, Supplier, Carbon & Environmental Performance Manager***

Francis and Farhan added that moderation of environmental collaboration also helps validate the accuracy of the information shared. They reiterated that FSC and non-FSC timber look the same, so establishing transparency in the operations is important to validate the accuracy of the green claims. Francis and Farhan highlighted that

transparency throughout the chain helps all partners validate the green claims and promote their green orientations more confidently. Garret's organisation often provided tours of his logistic operations to customers; they also have numerous YouTube videos demonstrating their green operations. He noted it is important for his organisation to eliminate customer's doubts through open and accessible information sharing. Garret validated the accuracy of his green claims through open and accessible information sharing.

> *"We run facility tours for our current and prospective customers so we can prove what we're saying is correct. We have got a whole heap of little YouTube videos we have certainly put our money where our mouth is and been available and transparent to prove what we are saying is 100% correct at any stage of the process. So, we stand by what we say, and we allow our customers to audit our plant and to visit and tour our plant when they want to anyone can come and have a look if they doubt it."- **Garret, Logistics, Trade & Industrial Sales Manager***

William and Warren were a retailer with over 400 partners across their chain. They are also on the path to make their supply chains more sustainable. They get numerous questions from customers about their partner's activities. On the one hand, William and Warren were environmentally collaborating with their partners to ensure sustainable targets are being met. On the other hand, they provided open and accessible information to customers on who their partners are and what are the sustainable objectives they are targeting. By proving access to information on their alignments they aim to address customers concerns on the validity of their claims.

In conclusion participants noted that open and accessible information sharing is needed to facilitate environmental collaboration. Some of the methods participants noted was protecting the confidentiality of the information which allowed for open and honest conversations to occur. Associations called for accessibility of information sharing across the industry to help co-develop regulations that address industry needs. Some participants relied on using globally recognised schemes to record, track and report information. They noted creating a platform that is accessible to everyone helps in a creating a more synchronised collaboration. Participants also noted transparency in information sharing helps validate the accuracy of green claims. Others established this

through providing tours of their operations and listing their sustainable objectives with all partners on their website. Participants agreed that establishing transparency in information sharing helps in upstream and downstream environmental collaboration across the chain.

### 6.5.2 Transparency in Relational Investment

Transparency in relational investment is defined as the partner's openness to the degree of commitment to environmental collaboration. Relational transparency is more intent, and character driven than operationally driven (Kanagaretnam, Mestelman, Nainar, & Shehata, 2014). Participants noted that trusting their partners in committing to the environmental objectives is important. However, this surpasses trust, and it is knowing that partners are committed to investing in the changes to attain environmental objectives. Therefore, an open relational commitment helps participants in managing their expectations of the investments incurred for environmental collaboration(Brun et al., 2020).

Bruno highlighted that a supply network has various partnership that desire different values from the environmental collaboration. Hence, as an association he often addresses the different desires by requesting organisations to be transparent in their commitment, concern, and investments for attaining the environmental objectives. By having an open and honest conversations about the commitment the partners are willing to invest they reach a common understanding amongst partners. Bruno notes that transparency in relational investment also allows partners to understand their respective roles in the environmental collaboration. Bruno's role as an association was discussed previously but highlights that by providing consultations, networking events and webinars he facilitates in providing accessible and open platforms for participants to environmentally collaborate.

> *"We are dealing with various perceptions. you've got to make sure that every partner sees a common value in the objectives and that we are honestly committed to accomplishing it together."* ***– Bruno, Association, CEO***

Isabella agreed that transparency in the relational investment is needed to synchronise partner's commitment to environmental collaboration. As a global retailer Isabella

invested considerably in the environmental collaboration with their partners. She regionalised the environmental objectives to help partners achieve the outmost value of the objectives in accordance with regional regulations and needs. She provided environmental code of ethics that were accessible and adaptable for partner's intent. As much as she demonstrated relational investment in helping develop partner's operations, she was also open and honest in the non-negotiable practices that must be eliminated. Isabella openly conveyed that child labour and illegal logging shouldn't be practiced throughout the chains across the globe.

Francesca echoed the need for transparency among partners. Francesca added that the green issues organisations are experiencing is reflective of the lack of industrial collaboration. She noted that fragmented supply chains and no communication among partners hinders the industry's response to environmental issues. She noted that industrial coordination for environmental objectives requires transparent conversations to occur at supply network level. Francesca noted transparent information sharing leads to open and honest relational investment in cooperatively solving green issues across the industry. Although she did note that achieving relational transparency requires addressing critical questions in the operations that are challenging.

> *"The relationships must be co-operative. They need to be co-organised towards open, transparent, and honest understanding of conversations and communication to break the silos and collaborate as an industry to respond to everyone's challenges. We need to have honest, open conversations and putting inconvenient questions forward and seeking honest responses to those inconvenient questions."- **Francesca, Association, CEO***

Nathan previously highlighted that the Ministry for the Environment of New Zealand has conflicting values in comparison to their investment in the Dairy Industry of New Zealand. New Zealand drives more economic revenue from Dairy Farming that emits significant carbon emission. Hence the government invests in Dairy Farming more than aggregating the Forestry industry to increase carbon credit. Nathan previously noted that through collaboration of associations and councils they can utilise the steep dairy farmlands for forestry purposes. However, such co-operation requires transparency of relational investment from the government. Nathan noted transparency of information

sharing is needed to convey knowledge on the different species of trees that could planted to mediate the carbon emission of farmers. However, the lack of open and transparent relationship between associations and government restricts such solutions to be attained.

> *"Having co-operation and just understanding of where everyone's value would be a very good start to increasing this conversation and helping the cause. If council listened to this, we could help people see that small-scale forestry is profitable. We can help them plant trees that will be also good for carbon targets in the steep areas of dairy farms that are not used.,"- **Nathan, Association, CEO***

In conclusion, participants noted that to manage the various expectations across the chain it is important to establish transparency in relational investment. Participants who collaborated with various partners established open and honest conversations of the role and commitment partners needed to attain environmental objectives. However, associations did shed light that transparency in relational investment is also needed to facilitate supply chain and industrial environmental collaboration. However, synchronisation of values is also needed at an association and council point. Participants reiterated that open conversations and relationship will provide honest conversations that result in knowledge sharing for solving green issues like establishing green credit in collaboration with other industries.

## 6.6 Authenticity in Green Supply Alignments

Authenticity in green supply alignments refers to the sincerity and genuine intent of partners for environmental collaboration (van Rekom, Go, & Calter, 2014). Participants reiterated that environmental collaboration has many challenges and uncertainties (Wu et al., 2017). Hence, it is important that the green alignments are sincere in their intent to pursue environmental collaboration despite its challenges and uncertainties (de Almeida, 2020). The two supporting subthemes are authentic intent to collaborate and authenticity in green claims. Authentic intent to collaborate is defined as the sincerity and genuine intent for environmentally collaborating in the supply network. Previously participants noted that being transparent in their relational investment helps the supply network assess the expectations for environmental collaboration. Here, the sincere and

genuine intent for environmental collaboration is demonstrated through their commitment in pursuing the best plausible solutions when addressing green issues (Ranfagni & Guercini, 2014). Authentic intent to collaborate manifest itself during overcoming challenges of environmental collaboration for the betterment of the supply network (de Almeida, 2020).

Authenticity in green claims is defined as the genuine implementation of green standards. It was previously mentioned that validation of claims is needed to be assured throughout the network. Although communication channels and transparency in information sharing facilitates the validation of green claims, the genuine implementation of green standards by participants needs to be established (de Almeida, 2020). Auditing and moderation of environmental collaboration doesn't occur daily (Salama et al., 2009). Hence, partner's need to demonstrate their genuineness that the green claims are in fact abiding per green standards. Authenticity in green supply alignments is purely relational based and is developed continuously over time as the environmental collaboration evolves. The Table 6.6 summarises the key codes of authenticity in green supply alignments.

| Theme | Sub-Theme | Key Codes |
|---|---|---|
| Theme 6.6. Authenticity in Green Supply Alignments | 6.6.1. Authentic intent to collaborate | • Being sincere in making changes for sake of green issues<br>• Being sincere in addressing customer's scepticism<br>• Investing in relational quality during collaboration<br>• Collaborating on green issues that address partner's regional concerns |
| | 6.6.2. Authenticity in green claims | • Recording green claims<br>• Collaborating to validate green claims<br>• Collaborating on an authentic green story<br>• Sharing the authentic green story consistently |

Table 6:6: Key Codes of Authenticity in Green Supply Alignments

### 6.6.1 Authentic Intent to Collaborate

Authentic intent to collaborate is defined as the sincerity and genuine intent for environmentally collaborating in the supply network. Authentic intent surpasses the transparency in relational investment discussed previously. For example, the partners can be open and transparent in their commitment to reducing carbon emission (Kanagaretnam et al., 2014). However, their intent is perceived authentic through their continuous actions of achieving the environmental objectives mutually set (van Rekom

et al., 2014). Francis and Farhan noted that their choice of partnership depended on the partners authentic intent for collaboration. They reiterated that as they began assessing their current supply network partners for opportunities to environmentally collaborate, they had a lot of transparent and honest conversations of what entails in the collaboration. Francis and Farhan highlighted that although they met many partners that were open to operational collaboration, they didn't have the genuine intent to collaborate for environmental objectives. Therefore, the partners that showed genuine intent to achieve environmental objectives became the plausible candidates for environmental collaboration.

> *"The first honest conversation we had with our previous partners was that the current standards are no longer meeting our needs. We had a good relationship, but they did not want to become more sustainable. So, we went looking for others. What we found was that a lot of partners were just not that commitment. They honestly said it is something they want in the future but not now. So, a lot of these are open and frank discussions because it is a journey and needs sincerity from everyone."*- ***Francis and Farhan, Manufacturer, CEO & Marketing Manager***

Garret demonstrated his sincere intent for environmental collaboration by inviting his partners to view his organisation's operations. Garret's approach to transparently showing his operations also reflected on his organisation's genuine intent of investing in green solutions. He noted that by being open to his customers viewing the green steps taken by his logistic organisation, customer's doubts and uncertainties are eliminated.

Robert agreed that it is important to understand partner's sincere intent for environmental collaboration. Robert noted that he understands his partner's sincerity through increasing his personal relationships with them. Robert worked very closely with sub-suppliers in China, he noted that according to Chinese culture it is important to demonstrate sincere intent for collaboration by showing respect to the top managers. Hence, he insisted on his company's CEO to join them in one of the travels to China to create respect and personal relationships with their partners. Robert highlighted that he is the primary contact with the mentioned partners, however by respecting the cultural norms he showed his sincere intent to commit to the collaboration. In comparison, to

his New Zealand partners he created personal bounds through Kiwi cultural and social activities like playing golf. Robert's comments echo the nature of B2B relationships which are more interpersonal based. However, due to the uncertainties of environmental objectives the sincere intent to commit to the environmental collaboration is more challenging to establish.

> *"My relationships in New Zealand it is a little bit different, certainly to China. I think over a 20- or 30-year business relationship you can be open and become friends. With one of our big suppliers in Hawkes Bay, we play golf, we will talk about how they want to use less plastic packaging on what he sends us. So, it is an authentic relationship where we are very open and sincere with each other. If I was talking to my Chinese suppliers, I might have a different opinion."- **Robert, Manufacturer, Sustainable Manager***

Isabella expressed the organisation's sincere commitment to environmental collaboration differently. In her case, being a global leader as a furniture retailer having a personal relationship with all partners is very hard. However, the organisation shows their sincerity by investing in regional green issues the partners are facing. Isabella highlighted that the organisation's representatives in each region must learn the local language, invest in partnerships that help the local community and create objectives based on the green issues the partners are facing. She noted that through personalised collaboration the partners are part of long-term development process.

> "*We try to understand the local regulations, partner with the right NGO's, speak the language of the suppliers or the personnel. We invest in solving the water scarcity issues in Bangladesh where the furniture is manufactured. We invest in charities in each country. We listen to our suppliers, we help them to develop*."- ***Isabella, Retailer, Sustainability Developer***

In conclusion, participants reiterated that environmental collaboration requires enhanced commitment from partners. They reiterated that the uncertainties and trade-offs require sincere intent to invest in environmental objectives. Hence, participants noted that although many partners are committed to operationally collaborating not all partners are willing to collaborate for environmental objectives. Therefore, participants

highlighted that by inviting customers to see their green operations they show their sincere intent for environmental objectives. Others highlighted that creating stronger personalised bonds and setting regional environmental objectives that matter to partners help establish sincerity towards environmental collaboration.

### 6.6.2 Authenticity in Green Claims

Authenticity in green claims is defined as the genuine implementation of green standards. In the findings of Green Organisational Orientation, the participants reiterated that assurance is needed from partners that the green standards has been applied. Ensuring credibility of green claims helps organisations promote their green products confidently. In the findings of environmental collaboration, participants noted the green standards aren't always implemented hence the monitoring of partners and facilitation from associations is needed to ensure the green claims are authentic. However, Francis and Farhan also highlighted that authenticity in green claims is needed at an interpersonal level. Francis and Farhan called for more open and honest conversations with their partners to understand the credibility of the green claims. They explained that it is very common for organisations to be approached with products that appear to be green while upon investigation the claims aren't valid. Francis and Farhan also highlighted that since moderation and facilitation of certifications is not established, they rather create close partnerships to have more influence in the authenticity of the green claims.

> "*Some of our suppliers they play two sides of the fence, and they are not 100% on board with it. They are certified but they say one thing and do another. we wanted more control on the promises we made, so we did not want to spend a bunch of money on those environmental sort of certification processes we rather work closely with our partners to make sure the claims are valid. authenticity of specifications is a weakness because the process has been corrupted. I know it has. You can't build your argument solely relying on the standards anymore" -* ***Francis and Farhan, Manufacturer, CEO & Marketing Manager***

Edward also reflected that by creating close partnerships with his suppliers they overcome challenges in implementing the green standards. Edward realized that he

could not have a strong stance in promoting his green products because he doubted the credibility of the claims. Therefore, he was inspired to seek the genuineness of the claims by collaborating more closely with his suppliers. He noted that although the relationship has not matured too much, he is able to ensure the authenticity of claims is implemented by partners through collaboration.

Robert and Robin echoed the importance of credible story telling. Both partners were seeking authenticity in claims proactively because of their customers. Robert and Robin manufactured and supplied commercial furniture for schools, universities, and prisons. Their biggest market was schools whose students are protesting government's complacency towards climate change. Robert noted that if his supply chain does not remedy the inaccuracies in their standards, they will not have an authentic story to stand by. Robert was nervous that one day their students will start questioning their credibility because they are environmentally conscious. Therefore, Robert had a very close relationship with Robin and encouraged Robin to build strong partnerships with their overseas suppliers to ensure the credibility of green claims can be validated.

> *"And the biggest risk I foresee is that our end-users who are kids, they're the ones that are out protesting climate action and doing experiments at school and asking questions, so I think it is a huge risk for our organisation if we don't actually have a story around it because at some point, I feel that an 8-year-old is going to go – Where does this come from? And if we do not have a good story around where it comes from, its life, why it is being used, then what happens to it after, and we might end up somewhere we don't want to be." –* ***Robert, Manufacturer, Sustainable Manager***

Robin agreed with Edward that the assurance of green claims helps them build a genuine story for campaigns. He reflected that once he can substantiate the green claims with his partnerships, he is planning to be more proactive in advertising and branding. He noted that authenticity in claims takes a long time to establish because of the evolving green solutions and close relationships required to establish transparency in the operations. However, being able to back up the claims and increase their marketing campaigns is worth the relational investment to increase demand of green products. He concluded that the genuine story also bears more value for customers because its more

sincere than green facts. Comparatively, Marco a small-scale timber supplier had full confidence in the sustainability of his operations. He noted that his customers have been buying his timber for over 10 years because his has authentically implemented the green standards. He realized that customers continue purchasing his timber for boats and furniture because the product story is consistently genuine.

> *"We have built up quite a good local buyer who are repeat customers that are, the likes of boat builders or local furniture makers and people who are builders and do timber joinery into particle building. They look for local products with local stories that are authentic and honest."* ***-Marco, Supplier, CEO & Marketing Manager***

In conclusion, participants noted that authenticity in the implementation of standards is needed to validate the green claims they make. As a long-term solution, they did call for better moderation of environmental collaboration throughout the chain and facilitation of associations to ensure green standards are implemented. However, establishing a supply chain and industrial moderation takes time and an elevated coordination of environmental collaboration. Therefore, as a short-term solution participant continuously investigated the authenticity of claims by enhancing the relationships with partners. The participants collaborated with partners to implement green standards together and join resources in addressing the challenges. They noted that authenticity of claims through interpersonal relationships takes time however it validates the genuine story of green products which is needed for assurance of promotional campaigns and green branding.

## 6.7 Summary of Key Findings of Relational Factors

In this chapter the themes of relational factors were explored that influence environmental collaboration in the supply network. These included establishing green supply alignments, dynamic power asymmetries, trust and communication in the green supply network, transparency in sharing green resources and authenticity in green supply alignments. The relational factors strengthened the environmental collaboration in the supply network. Establishing green supply alignments centred around finding the right partners to environmentally collaborate with. The complexities of power

asymmetries resulted in shifting power dependencies in the network which could be mitigated with the right partner alignment. Trust in the green supply alignments was also evident due to the existing trust partners had for operational collaborations. The significant difference however is that trust in the commitment and relational recovery after failures is more important. Communicating in a green supply network was to form communication channels and disseminating green knowledge. The second step to coordinating environmental collaboration was integrating information and knowledge through the network. Hence, the relational factor of communication in the green supply network helps facilitate this coordination step. Transparency in sharing green resources was underpinned by transparency in information sharing and relational investment. Consecutively it was emphasized that green knowledge is limited and needs to be cultivated for the momentum of environmental collaboration. However, beyond the need to integrate and then communicate this green knowledge in appropriate formal channels is the sharing of the information in an open and accessible manner. This also demonstrates the level of commitment the partners have in investing for environmental collaboration. Finally, authenticity in green supply alignments demonstrated the genuine intent to collaborate and sincere implementation of green claims. Partners must demonstrate distinctively their genuine commitment to environmental collaboration for the betterment of the environment versus securing the reputation of the brand as it influences the quality of cooperation in the network. However, sincere implementation of green claims helps validate the green claims made during environmental collaboration and address partner's uncertainty.

# Chapter 7 Discussion

## 7.1 Introduction

This research took a grounded theory methodology lens to explore environmental collaboration in a supply network. In pursuit of this, the precursors of environmental collaboration emerged as being an earlier form of green organisational orientation. The point at which operational collaboration extends to environmental collaboration emerged. The operational and relational components of supply chain and industry environmental collaboration emerged. The relational factors emerged as relational attributes that strengthen the bond between green organisational orientation and environmental collaboration amongst partners. Therefore, the overarching research questions addressed in this research are:

*Research Question 1: "What are the factors that create a green organisational orientation?"*

*Research Question 2: "How does green orientated organisations environmentally collaborate in the supply network?"*

*Research Question 3: "What are the relational factors assisting green organisational orientation and environmental collaboration to transpire between channel partners?"*

Through inductive reasoning, the responses of 21 participants were analysed using thematic and cross comparison analysis. The three dominating categories that emerged were green organisational orientation, environmental collaboration, and relational factors. Figure 7.1. illustrates the conceptual framework that inductively emerged from the findings discussed in Chapters 4, 5, and 6.

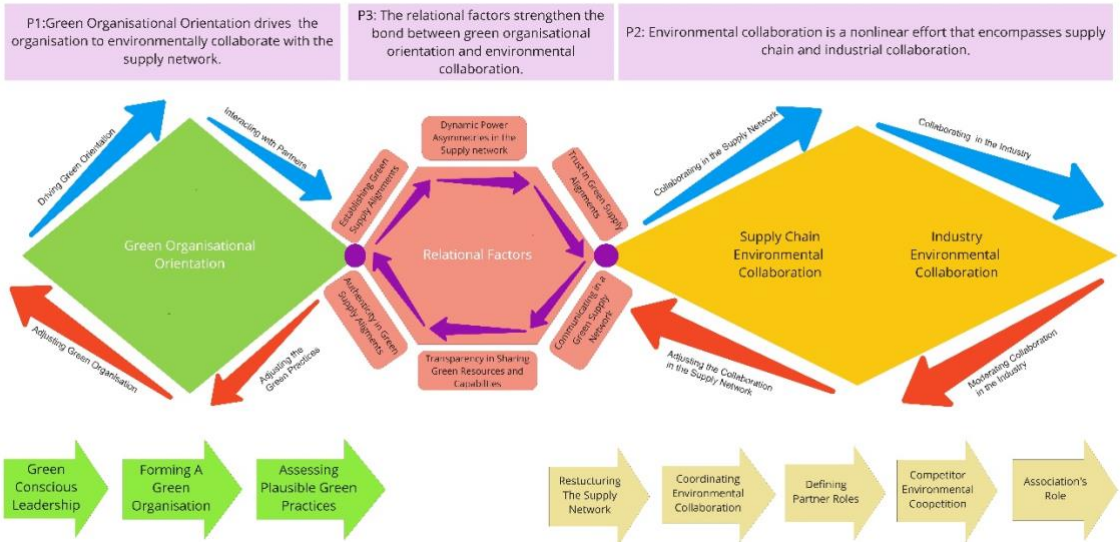


Figure 7-1: Conceptual Framework of Green Organisational Orientation driving Environmental Collaboration

## 7.2 Significance of Findings

Environmental collaboration is needed to attain a green, sustainable supply chain management and a circular economy (Hazen et al., 2020). It takes a total system perspective that influences all parts of the organisation and occurs as an extension to an existing operational collaboration (Ahmed et al., 2020). However, environmental collaboration is explored quantitatively and often as a mediator or moderator of the green supply chain management (Micheli, Cagno, Mustillo, & Trianni, 2020). Hence, the organisation's commitment to environmental collaboration dictates their green performance outcome in the supply network (Ilyas et al., 2020). The literature calls for a further qualitative exploration of an understanding of the precursors that drive environmental collaboration in the supply chain (Govindan, Aditi, et al., 2021). Also the point at which operational collaboration extends to environmental collaborations needs theoretical support (Wong et al., 2021).

Environmental collaboration is influenced by operational and relational characteristics (Srivastava et al., 2015). To understand the relational characteristics that influence environmental collaboration in the supply network, the participant's collaborating partners were tracked to be interviewed. Tracking the collaborative partners allowed for the theory built to be in line with pragmatism philosophical lens of exploring environmental collaboration in the network context in which it occurs. This new

methodological lens resulted in a network understanding of six relational factors that strengthened environmental collaboration in the supply chain. Understanding the six relational factors in a network perspective means responding to the call of the literature to explore supply chain relationships in the network they exist and interact in versus from a dyad or triad perspective. Environmental collaboration actually exists as the extension of an existing operational collaboration with existing partners (Arora & Arora, 2020). The supply network is made of myriad existing partnerships that have stability and longevity due to their relational characterises, which has helped them achieve operational and economic stability (Awan & Khan, 2021; Rezaei Vandchali et al., 2020). These existing relational factors influence environmental collaborations in a network of partnerships. The theoretical contribution of each category is discussed in the following sections.

### 7.2.1 Proposition 1: Green Organisational Orientation drives the organisation to environmentally collaborate with the supply network.

The precursors of environmental collaboration were identified through quantitative methods as the commitment of top management, green policy, and the environmental management system (Asif et al., 2020; Lee & Joo, 2020). These precursors are recognised as internal collaboration as they refer to an organisation's internal cooperation in pursuing green issues with a potential supply of network partners (Trujillo-Gallego et al., 2021). Through taking a qualitative and exploratory lens, this research further extends the existing knowledge about the precursors of environmental collaboration by defining this as a green organisational orientation. Green organisational orientation is defined as the activities a firm adopts in addressing environmental issues. Green organisational orientation has proven to be driven internally by the organisation, within the bounds of their resources and capabilities, and are compatible in solving the green issue (Al-Sheyadi et al., 2019). The three themes that emerged in support of green organisational orientation was green conscious leadership, forming a green organisation and assessing plausible green practices. The theoretical contribution of each will be discussed in the following section.

#### 7.2.1.1. Green Conscious Leadership

Green conscious leadership refers to a leader that addresses green issues in their decision making. The theme is underpinned by the sub-themes of a leader's personal green consciousness, and role of green conscious leaders. The role of top management in pursuing environmental collaboration has been identified as the leader's commitment to and support of collaborations with suppliers or customers to increase the environmental performance of the organisation (Lee & Joo, 2020). This research further extends to the academic knowledge that in fact green conscious leaders drive an organisation's commitment towards green issues (Ilyas et al., 2020). However, as alluded by Liu (2019) and Burki, Ersoy, and Najam (2019), the role of green conscious leaders is much more diverse and surpasses the bounds of a commitment to environmental collaboration only.

Rather, it is the theoretical contribution of this research that identified that a leader's personal green consciousness influences their commitment to pursuing green issues within their role. Leaders who have been exposed to green issues are more aware of the significance of pursuing such issues. As a result, the future of green conscious leadership is promisingly positive, due to the current awareness of green consciousness in generations Y and Z (Amrutha & Geetha, 2021). Furthermore, the rate of adoption in pursuing green issues will increase in an organisation due to the leader's genuine and sincere intent in attaining green solutions (Latan et al., 2018). The genuinely and sincerity underpinning the commitment positively influences employee's pursuit of green issues in their tasks. Therefore;

*P1:1A: Leader's personal green consciousness positively influences their commitment to green issues.*

The theoretical contribution of this research is that the role of green conscious leadership emerged as being more dynamic that just their commitment to collaboration (Sandberg & Abrahamsson, 2010). Rather, investigation to validate claims throughout the chain is a significant role that could address the lack of transparency in the supply chain (Brun et al., 2020). Persuasion also arose as a significant daily role for green conscious leaders, especially when they were confronted by shareholders. Unfortunately, solving green issues doesn't result in an economic return on investment

(Khan et al., 2019). Hence, the intangible non-economic return on investment towards green issues requires significant persuasion from green conscious leaders. Additionally, green conscious leaders must empower employees to pursue the issues in their roles through supporting the green issues that matters to them. The role of persuasion and empowerment extended the academic knowledge of recognising the adoption of green issues at an organisation level that is often recognised as a human resource department's responsibility (Yu, Chavez, Feng, Wong, & Fynes, 2020). In fact, those participants whose leaders empowered them to pursue green issues that resonated with them personally showed a genuine commitment to solving green issues, despite the challenges. The role of green conscious leaders' includes hiring and retaining employees who are also green conscious, which also provides a new theoretical understanding of the future requirements needed in the workforce of green orientated organisations (Chams & García-Blandón, 2019). Finally, complementary to the multifaceted characteristics of sustainability knowledge, the role of green conscious leaders is to continuously make decisions while drawing knowledge from various disciplines (Nazam, Hashim, Baig, Abrar, & Shabbir, 2020). The decision making of green conscious leaders is complex and has many risks(Dan Zhang, Wang, Zheng, & Yu, 2018). As depicted in the conceptual framework, the green conscious leader drives green orientation and then later adjusts the green organisation's practices, based on the developments acquired from environmental collaboration. Therefore;

*P1:1B: The role of green conscious leaders is dynamic and influences the dedication of internal and external resources of the organisation towards green issues.*

#### 7.2.1.2. Green Organisational Restructuring

The second theme that emerged when forming a green organisation was creating an organisation that pursues green issues. Green organisations have been explored in terms of internal capabilities and sustainable development in the management literature (Ogbeibu, Jabbour, Gaskin, Senadjki, & Hughes, 2021). However, the influence of forming a green organisation with the overall intention for environmental collaboration is one of the theoretical contributions of this research. The supporting sub-themes of forming a green organisation include green organisational restructuring, understanding the stages of environmental concern, and developing a green culture.

Green organisational restructuring involves reforming the business model and the hierarchical structure of the organisation to be adaptive in pursuing green issues. For the organisation to be receptive of the changes needed in pursuing green issues, restructuring is critical (Vaccaro, 2006). In a supply network, various organisational structures exist, however, the two types of structures that facilitated the pursuit for green issues included a decentralised and a matrix structure. Conversely, the franchising model proved to be the least adaptive to addressing green issues. The reduced adaptability and receptivity is due to the fast paced decision making needed when pursuing evolving green issues that require knowledge from various disciplines and in accordance with regional guidelines (Hafezalkotob, 2015; Quist & Tukker, 2013). Hence, a decentralised and matrix organisational structure empowers rapid decision making and team work amongst employees to pursue green issues within their role and region, despite the uncertainties (Aboelmaged & Hashem, 2019). Therefore;

*P1:2A: Green organisational restructuring creates an adaptable decision-making hierarchy that is receptive of pursuing evolving green issues.*

Understanding the stages of environmental concerns means assessing the internal stakeholder's stages of concern regarding green issues. Customers environmental concerns have been found to influence their green shopping behaviour (Garai, Mondal, & Roy, 2018; Zulfiqar & Shafaat, 2015). However, this research proposes a new theoretical contribution in understanding the various stages of environmental concern the internal stakeholders are at. The influence of green conscious leaders and restructuring of the organisation is not sufficient for the internal stakeholders to pursue green issues in their daily roles (Amrutha & Geetha, 2021). In fact, most of the solutions to green issues relies on employee's expertise and knowledge, a critical capability in sustaining green orientation over time in an organisation (Luu, 2018). Understanding the different stages of environmental concerns helps green conscious leaders influence employees to progress through the stages and become more receptive to pursuing green issues (Saifulina & Carballo-Penela, 2017). The stages that were identified include disregarding, comforting, reactionary, proactive, green centricity, and collaboration. The aim of a green organisational orientation is to ideally transition through the stages and encourage employees to think about incorporating green solutions in their roles.

However, requesting employees to pursue green issues in a stage of disregarding will have an adverse effect on employee satisfaction and performance (Alola, Cop, & Tarkang, 2020). Conversely, by personalising the green issue to match the distinct stages of environmental concern will motivate employees to pursue solutions that resonate with them (Amrutha & Geetha, 2021). Therefore;

*P1:2B: Understanding stages of environmental concern positively influences the organisation's transition towards an environmentally collaborative enterprise with stakeholders.*

Finally, developing a green culture means creating a culture that sustains addressing green issues over time. The influence of green culture has been insignificant in pursuing environmental collaboration (Porter, 2019; Sung & Kim, 2019). However, the influence of green culture on green organisation has been significant and supported in the literature (Bae & Grant, 2018; Kumar et al., 2021). The findings of this research further extend to the academic knowledge that developing a green culture is not enough by itself to drive the organisation towards environmental collaboration. Rather, through continuous development it facilitates the adoption of a green organisational orientation, which drives environmental collaboration. Furthermore, developing a green culture through training, hiring, and cultivating an employee's green expertise and knowledge is instrumental in sustaining green orientation over time. Since the collaborative partners were tracked and interviewed in this research, green culture was most dominant within the green network alignment. Participants who resonated with each other's green culture where more synchronised during the collaboration. Therefore;

*P1:2C: Developing a green culture facilitates the adoption of green organisational orientation for internal stakeholders.*

#### 7.2.1.3. Assessing Plausible Green Practices

Assessing plausible green practices means that evaluating the green activities that need to be incorporated into the organisation when pursuing green issues. The green practices that have been identified in the context of supply chains are green procurement, environmental management systems, green manufacturing, and green logistics etc. (Rebecca Stekelorum et al., 2021). In the management literature, green

practices have been identified as lean management, waste management, green strategy, eco designing, customer cooperation and pollution prevention (Habib et al., 2021; Vachon & Klassen, 2006). In this research, the green practices that emerged were internal capabilities that were continuously assessed for development (Micheli et al., 2020). The theoretical contribution of this research is that assessing plausible green practices emerged as the point at which operational collaboration extends to environmental collaboration. The choice of green practices was assessed based on the green issue being targeted, the internal resources and capabilities of the firm, and on the forgoing of potential competitive advantage when collaborating (Habib, Bao, Ilmudeen, & Soobaroyen, 2020). The identified green practices included green tactical approaches, compromises of developing a green product, incorporating green processing, value appraisal of green orientation and concerns of green promotion.

Green tactical approaches are the strategic approach the organisation uses to pursue green issues. This finding extends the current knowledge on green strategies and supports previous research on the foremost role tactical approaches have in driving for green orientation and environmental collaboration (Li, Shi, et al., 2020; Tsai, Liu, & Li, 2018). However, not one approach best suited all participants; rather an overarching set of tactical approaches were revealed. These included setting scientific targets, assessing returns on investment, a quarterly review of green issues, investing in R&D for green innovation, and building resilience. Amongst these concerns, building resilience over time was the most popular tactic to withstand the uncertainties and evolving nature of pursuing green issues (Pettit, Croxton, & Fiksel, 2019). To bridge the significant gap in green knowledge, investing in R&D and green innovation was a capability that was needed to strive for environmental collaboration (De Stefano & Montes-Sancho, 2018; Silva, Gomes, & Sarkis, 2019). Therefore;

*P1: 3A: Green tactical approaches coordinate the tactical and strategic activities of the organisation in pursuit of solving green issues.*

The compromise of developing a green product is the concessions in creating a green product. which was a consistent challenge participant faced in their pursuit of a green orientation. Developing a green product has been the centre of discussion in various disciplines. The influence of green products in terms of green production (Li, Guan, Shi,

& Jiao, 2019), green marketing (Zhang et al., 2021), eco-designing (Wu, Zhang, & Yang, 2020) and ISO certifications (Zobel, 2013) has been explored by many scholars. At its core, green production seeks to ideally produce a product that is environmentally friendly (Li, Guan, et al., 2019). However, two dominating challenges exist in developing a green product, including the lack of sustainable alternatives for product components and the need for further research and development (Kuiti, Ghosh, Gouda, Swami, & Shankar, 2019; Zhang et al., 2021). To overcome these challenges, this research extends the existing knowledge that environmental collaboration is needed (Feng et al., 2020). Suppliers emerged as having the most significant role in addressing the challenges of developing a green product in the supply network. Their knowledge about sustainable raw materials is significant yet not integrated into the supply network, due to a lack of coordination and collaboration with upstream partners (Andersén, 2021). The engagement of customers was also critical in assessing their experiences with a compromised green product that needs continuous development (Itani, Kassar, & Loureiro, 2019). Finally, industrial collaboration is also needed to synchronise the efforts towards an acceptable norm of a green product that will reduce the scepticism and uncertainty in a customer's decision making when purchasing a compromised green product (Shu-qin & Wei, 2008). Therefore;

*P1:3B: Compromises of developing a green product requires the coordination of the supply network and industry to increase green production.*

Incorporating green processing means adapting the operations of the organisation to become green. Incorporating green processing into an existing process is best done incrementally and seamlessly as not to risk the economic performance of the organisation (Li, Ye, Sheu, & Yang, 2018). Incorporating green processing creates a domino effect on other parts of the organisation, hence the choice of what aspects of green processing to take on is also important. The types of green processing incorporated varied, from waste tracking, recycling, flat packaging, green freight to carbon calculators and more (De Giovanni & Cariola, 2020). The challenge when incorporating green processing was the lack of measurement tools to track the progress of the organisation's efforts (Elgazzar, Tipi, & Jones, 2019). Since this was a common problem across the supply network, industry collaboration mitigates this challenge and

helps in elevating the measurement standards in the industry as a norm. The assessment of incorporating green processing as an internal capability for a competitive advantage versus forgoing the competitive advantage to collaborate in supply networks is a constant consideration for organisations (Dangelico & Pontrandolfo, 2015). Therefore;

*P1:3C: Incorporating green processing gradually integrates existing operational collaboration towards environmental collaboration.*

Value appraisal of green orientation means estimating the monetary value of pursuing green orientation. The costs and expenses that are incurred doesn't always offer an economic return on investment (Jum'a et al., 2021). Rather, in most cases the economic return on investment is incurred over a longer period of time, while the non-economic returns are more immediate (Dongyang Zhang, Tong, & Zheng, 2021). In the green marketing literature, green pricing is often denoted for green products with a higher value appraisal, which influences the customer's perception of the brand (Vannie Naidoo & Rahul Verma, 2020). In the supply chain literature, the cost of a green orientation is often incurred by collaborative partners; however it is common for customer facing partners like first tier manufacturers or retailers to derive the most value from green pricing (Wei, Wang, Tsai, & Yang, 2018). This research contributes to academic knowledge of a value appraisal of green pricing in five ways.

Firstly, through environmental collaboration, the value appraisal of green orientation can be shared amongst collaborating partners (Zhao, Li, et al., 2018). Through environmental collaboration the second and third tier partners can also receive a return on their investment, which helps them sustain a green orientation and to increase green production. Secondly, if the value appraisal of a green orientation is shared amongst the supply network, the participation rates for environmental collaboration increases. Increased participation results in a higher economy of scale for green production, which will eventually lower the costs and expenses incurred as it becomes an industry norm. Thirdly, green conscious customers do appreciate the higher value appraisal of green products, however, to increase the demand required to achieve economies of scale, organisations should engage with customers about their experiences when considering the price of a compromised green product. Fourthly, by interacting with customers and collaborating with supply networks the value appraisal of green orientation can be

validated and shared throughout the supply network. By sharing the value appraisal throughout the supply network through collaboration the organisations will be more committed to green issues, despite the lower demand for green products by customers (Shao & Ünal, 2019). Finally, through industrial collaboration, the consistent shared value appraisal in the supply networks will result in economies of scale that will eventually make a green orientation and green products affordable for both organisations and customers. Therefore;

*P1:3D: Value appraisal of green orientation increases green production when its shared amongst collaborative partners in the supply network.*

The concerns of green promotion are the considerations made when promoting a green orientation. Promoting a green orientation from the perspective of the product and brand has been explored in the green marketing literature (Chang et al., 2019; Hsuan-Hsuan Ku, 2012). However this research responds to the call of the supply chain discipline in further understanding the influence of green promotion on environmental collaboration (Groening, Sarkis, & Zhu, 2018). From an organisation's perspective, this research supports previous findings that customers are sceptical about the validity of green promotional messages (Musgrove, Choi, & Cox, 2018). The organisations however don't blame customers for being sceptical, rather they call for industrial and government moderation when green washing happens in the industry (Wang, Walker, & Barabanov, 2020). This is due to the lack of accountability in organisations that practice greenwashing, which lead to the customer' trust in green promotion being negatively affected (Schmuck, Matthes, & Naderer, 2018). Despite this, from the organisation's perspective not promoting their green orientation portrayed a lack of compliance and care for environmental issues (Vannie Naidoo & Rahul Verma, 2020). Therefore, in this research it emerged that the concerns of green promotion are many and in fact the greenest orientated participants promoted the minimum of their efforts. Exploring this further, this research contributes to the influence of green promotion on environmental collaboration in four ways.

Firstly, to address the rising scepticism and customer mistrust about green promotion, it is important for organisations to validate the green claims through transparency in information sharing and authenticity in green supply networks. Promoting credible

green claims that the supply network can validate will provide organisations with more assurance when promoting their green orientation. Secondly, through industrial collaboration, green washing can be moderated, and organisations can be held accountable. Moreover, an acceptable threshold when promoting a green claim can be uniformly established as a practice in the industry. This reduces the number of mixed messages communicated from the industry to the consumers. Thirdly, the niche green knowledge that resides in second and third tier parts of the supply network provides the exact sustainable attributes evident in the raw materials. Through environmental collaboration the exact differences between sustainable and non-sustainable raw materials can be validated throughout the supply network. The communication needed during environmental collaboration can facilitate the designing of promotional campaigns that are educational to increase customer awareness and engagement in their role of increasing demand for green production. Finally, for the sub-tiered partners that don't have the economic investment for green promotion, by collaborating with upstream partners they too can receive their return on investment, which helps them sustain the uncertainty, risks, and costs of addressing green issues over time. Therefore;

*P1:3E: Concerns of green promotion can be addressed through commitment, transparency, and authenticity from all collaborative partners to increase green demand from customers.*

In conclusion, as demonstrated in the conceptual framework of a green conscious leadership and forming a green organisation, there are internal capabilities that help drive the organisation towards collaborating to attain green issues. However, assessing plausible green practices is the point at which interacting with the supply network occurs. After collaboration, the green practices are further adjusted to respond to the evolving nature of green issues during environmental collaboration.

### 7.2.2 Proposition 2: Environmental collaboration is a nonlinear effort that encompasses supply chain and industrial collaboration.

Environmental collaboration is the joint planning of supply chain partners to attain environmental objectives (Vachon & Klassen, 2008). Environmental collaboration has been researched as a mediator or moderator in creating green, sustainable supply chains and a circular economy (Hazen et al., 2020). The mediating or moderating role of

environmental collaboration has also been identified to considerably influence green manufacturing, green suppliers, and reverse logistics (Kuiti et al., 2020). The supply chain literature has also identified the stages, strategies, types, components, motives, enablers, barriers, and performance outcomes of environmental collaboration (Dangelico & Pontrandolfo, 2015; Gölgeci et al., 2019; Trujillo-Gallego et al., 2021).

Hence there is evidence that environmental collaboration has a substantial theoretical influence on green production (Trujillo-Gallego et al., 2021). This research extends the current knowledge in three ways. Firstly, earlier literature adopted a quantitative methodological technique, which doesn't provide an exploratory understanding of environmental collaboration (Mardani et al., 2020). This research responds to the call of the supply chain discipline by adopting a qualitative understanding towards exploring environmental collaboration (Chen, Zhao, et al., 2017; Dora, 2019). Secondly, the existing literature takes a lens on a focal company, with most of the respondents being manufacturers or suppliers (Govindan et al., 2019; Li, 2018). However, collaboration is an interactive process that influences all the processes in the supply chain and occurs in a network of partnerships (Gölgeci et al., 2019; Hofer, Hofer, & Waller, 2014). By taking a qualitative research technique and interviewing collaborating partners throughout the supply network, a theory is built in understanding of environmental collaboration is attained. Finally, theoretically environmental collaboration has been identified to have operational and relational components (do Canto et al., 2020). However, the elements of each component have been identified in this research as a new theoretical contribution identifying the coordination steps as operational, defining partner roles and relational factors as the relational components of environmental collaboration.

Complimentary to existing knowledge, environmental collaboration emerged as the combination of operational and relational interactions in the supply network (Ahmed et al., 2020; Trujillo-Gallego et al., 2021). The supporting subthemes of environmental collaboration in the supply chain are re-structuring the supply network, coordinating environmental collaboration, and defining partner roles for environmental collaboration. Extending the existing knowledge, environmental collaboration emerges as more than a supply chain process; rather an industrial perspective is considerably

valid and needed (Pero et al., 2017). The supporting subthemes of industry environmental collaboration are competitor environmental coopetition and association's role. The proceeding sections discusses the theoretical contribution of each theme.

#### 7.2.2.1. Supply Chain Environmental Collaboration

Environmental collaboration occurs as an extension of an existing collaboration that occurs in the economic performance of the chain (Jraisat et al., 2021). The first theme that emerged was about restructuring the supply network, which means the re-alignment of the supply network to assess plausible partners for collaboration. Restructuring the network involves making the chain lean to increase its efficiency and reduce waste (Das, 2019; Sharma et al., 2020). Through restructuring, the alignments between regions, industries, and green issues are mapped throughout the chain. This allows organisations to understand in which tier the green issues reside, or which non-compliant alignments need further attention. This research supports the current green supply chain literature that restructuring the network to include more domestic alignments does reduce the carbon emission of the value chain (Awaysheh et al., 2010; Carnovale, Rogers, & Yeniyurt, 2016).

Restructuring the supply network needs continuous development because alignments throughout the tiers in the network grows and diminishes progressively, without being common knowledge among others in the value chain (Defee & Stank, 2005). Therefore, this uncontrollable phenomenon creates a domino impact across regions, industries and tiers (Miemczyk et al., 2012). Changes in the network are unpredictable and occur in various regions and industries (He & Sun, 2020). However through continuous monitoring the restructuring of the network organisations can develop governance by aggregating parts of the value chain that they already collaborate with (Wong et al., 2021). In hindsight, organisations can then shed light on some parts of the "black box" phenomenon, often applied to supply chains (Fawcett, Fawcett, et al., 2012). Furthermore through aggregating the alignments in the network the cross cutting resources and capabilities that is needed to solve green issues surfaces (Gligor et al., 2020). Therefore;

*P2:1A: Restructuring the supply network aggregates the collaborative partners towards a coordinated environmental collaboration.*

Once the alignments in the network are evident, the coordination of environmental collaboration occurs, which means organising the environmental collaboration process in the network. Coordinating environmental collaboration emerged as a significant need for organisation's to have some governance in the collaborative process (Z. Huang, Nie, & Tsai, 2017). The coordination steps extend the current knowledge on the stages and components of operational environmental collaboration, with the distinct difference that it provides an inter-organisational understanding at a network level (Du, Liu, & Li, 2017). The coordination steps are (1) identifying existing resources and capabilities; (2) integration of information and knowledge; (3) formalising environmental objectives; (4) unifying green standards; (5) developing an environmental code of conduct; (6) constant environmental reporting, and (7) the monitoring of environmental practices.

In step one, the organisations identify their existing resources and the capabilities evident in the network that will be needed to solve the targeted green issues (Andersén, 2021). Since the supply network is fragmented, underutilised resources and capabilities can also be identified. A resource that needs to be recognised is the market size and share of customer demand for a green product versus market share (Ghosh & Shah, 2015). This supports current academic knowledge on the disparity between green production, which is due to the lack of insight about the market demand for green products with non-customer facing partners (Kirchoff et al., 2011).

A capability that emerged as a significant need was utilising green marketing throughout the supply network (Chan, He, & Wang, 2012). Recent literature calls for further understanding of the influence of green marketing in the supply chain; this research provides a new theoretical perspective (Brindley & Oxborrow, 2014; Govindan, Shaw, et al., 2021). Firstly, green marketing is needed by sub-tier suppliers to promote the sustainable raw materials that were often overlooked by upstream partners. Secondly, by coordinating the efforts of the supply network, the story and messaging needed for green marketing can validate the credibility of green products for customers. Finally, by establishing credibility in the green marketing approaches the customers scepticism

reduces over time which is needed to respond to the gap of supply and demand of green products for the supply chain to respond to (Asif et al., 2020).

In step two the information and knowledge throughout the chain is integrated. The importance of knowledge management for green, sustainable, and circular economy is well supported in the literature (Peng et al., 2020; Uniyal, Mangla, Sarma, Tseng, & Patil, 2021). It is well established that knowledge is fragmented throughout the chain (Nazam et al., 2020); further knowledge about green solutions is in the research and development phase, which is constantly evolving (Pham & Pham, 2021). Therefore integrating the existing knowledge evident in the chain is a significant capability needed to solve green issues (Ji et al., 2020). This research further supports the existing literature that green knowledge is a capability that needs to be integrated, shared, cultivated, and recorded throughout supply networks to increase the scale of green production and solve green issues.

In step three, the environmental objectives are formalised amongst the collaborating partners. Since environmental collaboration occurs concurrently with existing operational collaboration, the former is often neglected during times of uncertainty and the need for economic resilience (Pettit et al., 2019). Hence a new theoretical perspective of this research is contributing to the literature that formalising environmental objectives motivates partners to prioritize environmental collaboration. In hindsight, when the process of formalising the negotiated environmental objectives happens, the partners can express the non-negotiable practices and compatibility of the set objectives within regional regulations. This step emerged as particularly good for sub-tier suppliers whose needs and concerns were often overlooked by upstream partners (Wilhelm, Blome, Wieck, & Xiao, 2016).

In step four the green standards are unified. Supply networks are made up of various industries across regions (Boskabadi, Mirmozaffari, Yazdani, & Farahani, 2022). The greens standards that are evident across the chain vary depending on the product, process, industry and region (Xu, Boh, Luo, & Zheng, 2018). Furthermore, the choice of compliance is not limited to one standard but rather a variety of cross cutting standards, programmes and certifications exist (Jabbour, Jabbour, Latan, Teixeira, & de Oliveira, 2015). This introduces significant complexities, especially since most partners adopt

different standards (Swarr et al., 2019). Therefore, this research extends the current understanding that unifying green standards provides a common measurement and denominator for partners to collaborate and synchronise their efforts in pursuit of green issues.

In step five an environmental code of conduct is developed. Through the preceding steps a significant amount of knowledge has been accumulated that could be refined to create an environmental code of conduct for partners. Developing an environmental code of conduct further contributes to existing knowledge by encouraging collaborative partners towards compliance with green standards (Egels-Zandén et al., 2015; Govindan et al., 2019). Firstly, developing an environmental code of conduct amongst collaborative partners sheds light on the non-negotiable practices that aren't compromised, for example, child labour (Govindan, Shaw, et al., 2021). Although social responsibility in supply chains is still in an early stage of academic knowledge, developing code of conducts could allow transparency in the operations of collaborative partners (Khan, Zkik, et al., 2021). Secondly, developing a code of conduct brings to light the allied set of conducts expected during environmental collaboration when attaining green objectives (Liu et al., 2015). The benefit of developing a document that dictates the accepted code of conduct from collaborative partners is that the "how to" measures are not compromised by the "black box" trait of supply networks (Fawcett, Fawcett, et al., 2012). Despite the benefits, environmental codes of conduct are not common in collaborations, yet this research finds that the participants who did practice them developed a form of governance in the coordination steps. Eventually the codes of conduct are constantly developed as the issues attained change, but it helps to align and organise collaborative behaviour amongst partners (Mashele & Chuchu, 2018). Finally, the code of conduct becomes green knowledge that is cultivated and harboured to track the progress of environmental collaboration in the network (Dwyer & Dwyer, 2009). This ultimately makes the collaboration process more meaningful for partners and works to raise the green standards in the industry (Egels-Zandén et al., 2015).

In step six constant environmental reporting is conducted. The trait of supply networks being a "black box" is caused by information entering and returning from collaborative partners (Shad, Lai, Fatt, Klemeš, & Bokhari, 2019). Therefore environmental reporting

provides some transparency and coordination after the implementation of the environmental code of conduct (Bayne et al., 2019). The development of the roles and compliance of the partners depends on transparent reporting. It also captures the progress of collaborations and identifies plausible green issues that had previously been overlooked. This research supports previous findings that constant environmental reporting is a significant tool to further develop collaboration in the supply network (Mähönen, 2020). Adopting international reporting schemes helps the supply network to adhere to reporting guidelines that are common knowledge and transferrable to an industry standard globally (Babatunde, 2019).

In the final step, the monitoring of environmental practices is implemented. As represented in the conceptual framework, the environmental collaboration is not linear in nature (Um & Kim, 2019). In fact, environmental practices should be constantly developed to reflect evolving green issues, new green knowledge, and the collaborative partner's commitment. Hence, monitoring environmental practices provides some governance in the coordination phase. It strengthens the collaboration between network partners and identifies any dependencies or barriers that needs to be overcome as a network (Green et al., 2012). Monitoring and mentoring during collaboration has been discussed previously although from the perspective of a focal company who initiates the collaboration (Meqdadi et al., 2015). However this perspective takes a power dependence stance on the collaboration and is contradictory to the "joint" involvement of the supply network (Hingley et al., 2015). Therefore, a new theoretical contribution of this research is that monitoring environmental practices helps validate the progression of environmental collaboration for further development; it can't be coordinated through a focal company's perspective but rather from a non-competitive organisation such as associations. Associations can help facilitate the monitoring of environmental collaboration amongst partners to reduce friction and conflict. Therefore;

*P2:1B: Coordinating environmental collaboration organises the operational components of environmental collaboration for collaborative partners.*

Parallel to coordinating environmental collaboration is also the definition of the roles of collaborative partners. Defining roles for environmental collaboration refers to outlining

the role and responsibilities of partners. The roles and responsibilities are dependent on the position of the partner in the supply network and their reflecting resources and capabilities needed to attain green issues. The new methodological perspective in this research provided the opportunity to explore environmental collaboration amongst existing collaborative networks. The common roles for each supply network partner emerged as unique but not mutually exclusive.

As supported by academic literature, the responsibility for green supply and production was very much within the collaborative role of suppliers and manufacturers (Bao, Li, Pang, Bao, & Yi, 2017). However, significant green knowledge exists within suppliers that needs to be cultivated for innovation, research and development (Yen, 2018). This research contributes to existing knowledge that aggregating green knowledge and increasing the supplier's role in environmental collaboration is considerably important in attaining economies of scale in green production (Ramanathan et al., 2014).

However, the responsibility for increasing the scale of green production is very much in line with the role of the manufacturer, which is well supported in the literature (Kisperska-Moroń & Zowada, 2017; Swierczek, 2019). However, the contribution of this research is in line with the recognised barriers to green production and a circular economy (Ghazilla et al., 2015; S. Kumar et al., 2021). The lack of coordination amongst supply networks makes investment in remanufacturing or green production considerably challenging for manufacturers to adopt (Bai & Satir, 2020). To mitigate such barriers, product stewardship programmes emerged as better alternatives to remanufacturing, with reduced risks and costs (Bacq & Eddleston, 2016). However, a new theoretical contribution of this research is that from an environmental collaboration perspective, manufacturers were identified as hubs for collaboration in the supply networks. This was due to their influence on eco-designing, green manufacturing, reverse logistics and close collaboration with retailers. However, this "hub" perspective could be distinctive to manufacturer-led industries such as the furniture Industry and needs further exploration in other industries (Sales-Vivó et al., 2020).

The role of logistics emerged as consistent with the existing literature in providing green transportation and the freight of goods along lower carbon routes (Ren et al., 2019);

however the feasibility of reverse logistics emerged as a significant challenge (González-Torre, Álvarez, Sarkis, & Adenso-Díaz, 2010). The challenges experienced were a lack of government participation in supporting lower carbon emitting routes, the nature of the product being transported, lack of remanufacturing, lack of product stewardship programmes and a low demand for reverse logistics (Julianelli et al., 2020). Therefore, contradictory to the reverse logistics literature, the economic feasibility of adopting reverse logistics was not evident in this research. Rather the findings support the idea that collaboration with waste management, product stewardship and recycling facilities proved to be more effective than reverse logistics for most product categories. Finally, an often-overlooked contribution of the logistics role was due to an infrastructural support of the operation of the supply chain across countries and industries where they can act as a catalyst for aligning organisations globally who wish to collaborate with likeminded green orientated organisations in the wider supply network.

Finally, retailers' roles concurred with current literature in engaging with green conscious customers for insights to improve environmental collaboration with upstream partners (Hu et al., 2019; Yan, Zhao, & Chen, 2018). However, this research contributes to the barriers of green supply chain management by identifying that the retailer's role in sharing information on green demand is important to close the gap for green supply for upstream partners (Boskabadi et al., 2022). Their customer facing position in the supply network also provides them with the responsibility to engage with customers in order to understand their expectations and experiences with compromised green products and green promotion (Sinha, Chaudhuri, & Dhumes, 2014). Retailers emerged as the first point of contact in reducing customer's scepticism about green promotions, address green washing claims and invite customers to be collaborative partners in the supply network. Therefore;

*P2:1C: Defining partner roles for environmental collaboration outlines the capacity and position of each type of collaborative partner during environmental collaboration.*

#### 7.2.2.2. Industry Environmental Collaboration

The research findings strongly support the fact that since supply chain environmental collaboration occurs within a network of partners across countries and regions, then industrial environmental collaboration is considerably important. Striving for industrial

environmental collaboration raises the green standards in the industry and increases economies of scale for green production over time. This research is one of the preliminary findings that explores industrial environmental collaboration. The theme of industry environmental collaboration was supported by competitor coopetition and associations' role.

Competitor environmental coopetition refers to a collaboration with competitors to address environmental issues. Coopetition with competitors is well explored and supported in the B2B marketing relationship literature (Christ, Burritt, & Varsei, 2017; Lomi & Pallotti, 2012). However, very few scholars have explored competitor coopetition in the context of environmental collaboration, and this needs further academic attention (Volschenk, Ungerer, & Smit, 2016). When unifying green standards, developing an environmental code of conduct, and the constant reporting and monitoring of environmental practice that elevated the involvement of industry players is needed. This is because most of the efforts strive towards creating an industry norm, with competitors being key partners in the collaboration process (Volschenk et al., 2016). Competitor coopetition also increases the momentum of environmental collaboration, and the response and scale of green production (Wang, Wang, et al., 2020). Therefore;

*P2:2A: Competitor coopetition increases the momentum of industry environmental collaboration to increase green production.*

Associations emerged as significant moderators and facilitators in coordinating collaboration at an industrial level. Their role as collaborative partners is to unite the industry and liaison with the government on environmental policies. Although the influence of NGOs is evident in the supply chain literature, the role of associations is worth further academic exploration (Khan et al., 2019; Rébecca Stekelorum, Laguir, & Elbaz, 2020) .

As part of uniting the industry, the findings of this research support that the notion that associations contribute to environmental collaboration through moderating collaboration in the supply network as non-competitive entities, aggregate supply networks, the dissemination of green training and knowledge to industry players, and

to aggregate industry needs for environmental policies. They also act as facilitators of environmental collaborations through monitoring power imbalances and monopolies in the industry. Their role in uniting the industry is important, since the supply chain is fragmented with many non-compliant partners evident across various tiers (Wilhelm et al., 2016).

Finally, the influence of government regulations as an enabler of organisations in pursuing green issues has been identified by numerous scholars (Giri, Mondal, & Maiti, 2019; Ilyas et al., 2020). An association's role in liaising with government emerged as a significant contribution in bridging government policies that address industry tailored needs for environmental collaboration. Their ability to aggregate supply chain networks and identify monopolies also helped them to liaison with government, with specific intervention goals to help facilitate environmental collaboration seamlessly in the industry. Associations emerged as key partners in inviting governments as key collaborating partners. As demonstrated in the conceptual framework, once environmental collaboration surpasses the supply network, industry collaboration begins. This involves competition coopetition and an association's involvement and moderation. Finally, supply chain environmental collaboration is further adjusted as an outcome of an association's liaison with the government. Therefore;

*P2:2B: Associations role as moderators aggregates the environmental collaboration at a supply chain level to strive for industry level environmental collaboration with liaison capabilities to engage policy makers as collaborative partners.*

### 7.2.3 Proposition 3: The relational factors strengthen the bond between green organisational orientation and environmental collaboration.

The preceding discussion has demonstrated that for organisations to environmentally collaborate, there is an internal green orientation that influences supply network and industrial collaboration. Environmental collaboration emerged as highly dependent on existing operational collaborations, coordination, and the role of supply networks. However, the intersect between green organisational orientation and the complexity of environmental collaboration is the influence of relational factors. Relational factors are the relationship characteristics that create a quality collaboration between partners in a supply network (Michalski et al., 2019). The supporting themes that emerged in

relational factors were establishing green supply alignments, the dynamic power asymmetries in the supply network, trust in the green supply alignments, communication in a green supply network, transparency in sharing green resources and the capabilities and authenticity of green supply alignments. Each relational factor has a role in strengthening the organisation's pursuit of an environmental collaboration. However, the relational factors always develop since the pursuit of environmental collaboration is a nonlinear path. The relational bonds between partners are continuously developed when pursuing more complex green issues. The proceeding sections discusses the theoretical contribution of each theme.

#### 7.2.3.1. Establishing Green Supply Alignments

The foremost dominant relational factor that emerged is establishing green supply alignments, which refers to aligning the organisation with likeminded green partnerships for environmental collaborations. The supporting sub-themes are choosing and synchronising partnerships. Establishing green supply alignments occurs in the preliminary stages when assessing plausible green practices. When assessing plausible green practices, the organisation evaluates whether pursuing green issues is best done through supply networks. Later, incorporating green processing collaborations becomes inevitable with others such as such as waste management, product stewardship programmes and more. Once the initiation begins it is through establishing green supply alignments that the restructuring of the supply network begins.

When choosing partnerships, the relational stability that exists due to existing operational collaboration is often the primary choice of partner for organisations to collaborate with. A lot of the inherit knowledge about production already exists, so coordinating environmental collaboration becomes more seamless. This research concurs with many B2B marketing scholars that, unless the existing partners are non-compliant to green issues, or the relationship is unstable, new partnerships for environmental collaboration were not pursued (Qu & Yang, 2015). Moreover, external partners, such as associations and product stewardship programmes emerged as viable partners that solve green issues but are not in the supply network. These findings extend the current knowledge that a supply chain doesn't exist in a vacuum and pursuing green

issues requires contributions from an elevate industrial perspective (Faisal et al., 2019). Therefore;

*P3:1A: Choosing partnerships for environmental collaboration aligns existing operational and relational stability and strengthens collaboration between the supply network.*

However, synchronising the partnerships emerged as a new theoretical contribution, since most of the supply chain literature focuses on dyad and triad collaborations (Hofer et al., 2014; Yadlapalli, Rahman, & Rogers, 2019). In a network of partnerships, synchronising efforts requires more education, training and personalisation of objectives that need the environmental code of conducts, environmental reporting, and the monitoring of practices to coordinate an environmental collaboration. From an industrial perspective, an association's role in moderating the collaboration for better synchronisation of networks is evident. Moreover, it emerges that sub-tier suppliers have already invested in green standards, yet due to the lack of consistent trade with upstream partnerships their economic and social issues are rising. A new theoretical contribution of this research is that exchanges of economic or social dimensions could elevate existing environmental standards throughout the supply network. Therefore;

*P3:1B: Synchronising partnerships through the co-ordinational steps strengthens the commitment and bond of the supply network to strive for mutually beneficial objectives during environmental collaboration.*

#### 7.2.3.2. Dynamic Power Asymmetries in the Supply Network

Dynamic power asymmetry in the supply network is the fluctuating power dependencies that exist. The supply network consists of various organisations with multitiered dependencies and an independence from influence and control in the operation of the supply chain (Talay et al., 2020). Hence, the environmental collaboration between a network of upstream large partners is very different to the collaboration between small scale sub-tiered suppliers in the downstream of the chain (Jraisat et al., 2021). The power asymmetries are constantly shifting, and synchronising the power at a network level is more challenging than being in a dyad and triad partnership (Touboulic, Chicksand, & Walker, 2014).

There is a recognition that environmental collaboration is a joint sharing and planning of supply network for green issues (Vachon & Klassen, 2008). However not all partners can or will contribute equally to the environmental collaboration (Jahanshahi & Brem, 2018). For example, the supplier's role is instrumental in providing green knowledge, while retailers can engage customers through credible green promotions. By defining the roles of partners, the dynamic shifts of power asymmetries would not negatively influence the momentum of environmental collaboration. However, to create a stable power asymmetry amongst collaborating partners, the green issues being pursued should be beneficial for all; thus, it is important to formalise the environmental objectives. More scholarly attention is needed in understanding power asymmetries in a network based collaboration, as this research is amongst the few contributing to the literature (Touboulic et al., 2014). Therefore;

*P3:2A: Shifting power dynamics is mitigated through establishing green supply alignments towards mutually striving for a win-win value driven environmental collaboration.*

Part of synchronising the power asymmetries in the network is to discourage one focal organisation from exerting more influence than others. Since scale and resource contributions are a significant capability in environmental collaboration, coercive power from a few partners commonly occurs (Chen, Wang, & Chan, 2017). Furthermore, during coopetition a competitor's monopolisation of industries may occur because of lobbying amongst key industry partners during the collaboration. In this case, the role of external partners such as associations is significant in moderating the collaboration towards a positive synchronising of power asymmetries. The supply chain literature recognises that NGO's and governments can influence the synchronisation of power asymmetries (Kelly, 2015; Sun, Xu, & Li, 2020) however the role of associations needs further scholarly attention. Therefore;

*P3:2B: Synchronising power asymmetries is mitigated through coordinating steps and associations to establish a non-coercive environmental collaboration amongst the supply networks.*

#### 7.2.3.3. Trust in the Green Supply Alignments

Trust in the green supply alignments is the continual belief and faith in partner's commitment to make mutually beneficial decisions when attaining green issues. Inherit trust existed among supply chain networks due to existing operational collaboration (Michalski et al., 2019). However, environmental collaboration is an evolving and uncertain route that may lead to more risks of failure than success. Hence, trust in the green supply alignments was supported by subthemes of trust in partner's commitment to green issues and trust in relational recovery after potential failures.

Trust in a partner's commitment to green issues is very important, as it determines the momentum and resilience of the network during an environmental collaboration (Pettit et al., 2019). When organisations assess plausible green practices, they determine their green alignments based on their belief that the selected partners will commit to a collaboration. Once the green alignment has been established, the trust in a partner's commitment was particularly important. Being committed to complying to the formalised objectives, standards and code of conduct is more important than moderation. The findings of this research concur with a number of scholars who have also highlighted that trust surpasses the need for moderation and auditing in the supply network (O. Meqdadi, Johnsen, & Johnsen, 2017). Since the reporting and moderation of environmental collaboration can't be conducted frequently (Um & Kim, 2019). Thus the network's continuous development of trust in each other's commitment to green issues is paramount (Tejpal, Garg, & Sachdeva, 2013). Therefore;

*P3:3A: Trust in partner's commitment drives the momentum of environmental collaboration in the supply network.*

Trust in relational recovery became paramount during the adjusting of collaboration in the supply network. In this phase, learning from mistakes and sharing the experiences with the supply network was more important than failure in attaining the set objectives (Franklin & Marshall, 2019). By sharing failed experiences, green knowledge and capabilities are further developed for the future and the trust in the relationships recovers, as everyone has communicated in good faith so as not to repeat the same

mistakes (de Almeida, 2020). Here transparent reporting is also critical in cultivating the knowledge that can be shared appropriately throughout the supply network. Trust in relational recovery has been explored recently in the B2B marketing literature (Franklin & Marshall, 2019); however in a network of relationships and in the context of environmental collaboration more scholarly attention is needed. Therefore;

*P3:3B: Trust in relational recovery drives the further development of environmental collaboration amongst the supply network post failures.*

#### 7.2.3.4. Communicating in a Green Supply Network

Communicating in a green supply network refers to the formal and informal exchange of information and knowledge between green alignments. A challenge that supply networks frequently experience is in pursuing environmental collaboration in a fragmented value chain (Mendoza-Fong et al., 2018). Communication in the value chain is most common amongst first tier partners and between dyad and triad partnerships, which results in other tiers of the chain becoming fragmented (Xiong et al., 2018). Communication is critical throughout the environmental collaboration, but especially in the coordination steps. Hence, the supporting themes that emerged were forming communication channels, and communicating green knowledge.

Forming communication channels helps the integration of information and knowledge at the coordination stage. Forming communication channels is needed to understand which partners who are non-compliant, partners who are committed, the resources and capabilities needed to attain the green issue and making decisions with accurate information. The importance of forming communication channels in the supply network has gained the attention of many scholars in business information systems (Soto-Acosta, Del Giudice, & Scuotto, 2018; Sun & Badi, 2020). he main outcome of forming communication channels is to aggregate the tiers in the supply network to invest in green production with real time information about green demand (Sun & Badi, 2020). However, as described in previous studies, the spatial distance, language and cultural differences that exist throughout the network continue to be a challenge that faces the coordination of environmental collaboration (Porter, 2019). Therefore;

*P3:4A: Forming communication channels integrates the fragmented green information and knowledge in the supply network for environmental collaboration.*

Communicating green knowledge persisted during and post environmental collaboration in the supply network and industry. Green knowledge is still in the research and development phase, which is continuously changing yet scattered across the world (Ji et al., 2020; Pham & Pham, 2021). Communicating this green knowledge is important to solve green issues and continue the momentum of environmental collaboration. However, communicating green knowledge isn't a norm, since participants felt uncertain whether green knowledge is a potential capability that could be a competitive advantage (Peng et al., 2020). Furthermore, they were conscious about the exchange of green knowledge, due to the many environmental damages still prevalent in their practices. Hence, they felt if they looked for green knowledge, they would also have to share their information, which might lead to an exposure of potential negative environmental practices that could impact their reputation.

Overall, a new theoretical contribution in this research was that there is a certain stigma around communicating green knowledge, which provided barriers for participants who were open to the exchange of green knowledge during collaborations. In the supply network, reporting is a critical tool used to communicate green knowledge that reflects on the existing supply chain knowledge (Shad et al., 2019). Additionally, associations proved to be important facilitators in communicating green knowledge across the supply network through trainings, webinars, newsletters, and workshops. Associations make green knowledge more accessible to supply networks, as they have an overarching view and knowledge of the industry and how competitors are utilising them. Therefore;

*P3:4B: Communicating green knowledge increases the pace and development of environmental collaboration in the supply network.*

#### 7.2.3.5. Transparency in Sharing Green Resources and Capabilities

Transparency when sharing green resources and capabilities refers to the accessibility and openness of partners when sharing their resources and capabilities. Resonating with

the proceeding section about lack of communication and the stigma around sharing green knowledge is also the lack of transparency in sharing green resources and capabilities (Zhu, Song, et al., 2018). Transparency in sharing green resources and capabilities is supported by the subthemes of transparency in information sharing and transparency in relational investment. Overall, transparency in the supply chain is still in the infancy stage in the literature and this research is in response to this gap (Brun et al., 2020).

Transparency in information sharing was needed throughout the environmental collaboration. The information shared had to be open and accessible from the compromises of developing a green product, concerns of green promotion, environmental reporting and uniting the industry for associations. The uncertainty and risks of environmental collaboration are further elevated by fragmented supply chains and the stigma that is associated with communicating green knowledge. Additionally, the knowledge and information that is shared, if it is not transparent, influences the supply network's decision making in solving green issues (Brun et al., 2020). The new theoretical findings of this research show that protecting information with non-disclosure agreements has been proven to be a good method to facilitate open and honest information sharing amongst collaborative partners. However, supply chain partners would be better to adopt the perception that transparently sharing information is for the betterment of the environment, rather using this as a tool to accuse the network of environmental damages. Moreover, relying on globally recognised standards, schemes and reporting has allowed a standardised benchmark of transparency sharing information amongst supply networks (Xu et al., 2018). Establishing transparency in information sharing is important in validating the green claims that are needed when addressing the concerns of green promotion. Hence transparency in the supply chain needs further scholarly attention (Zhu, Song, et al., 2018). Therefore;

*P3:5A: Transparency in information sharing validates the credibility of green information and knowledge shared during environmental collaboration amongst the supply network.*

Transparency in relational investments has proved to be significant in the defining partner roles in environmental collaboration. As previously mentioned, the commitment

and contribution of partners in addressing green issues is not equal (Jahanshahi & Brem, 2018). However, their investment in environmental collaborations should be conveyed honestly to the supply network. Each organisation may be in a different stage of environmental concerns, which influences their commitment to addressing green issues. Thus, in a supply network with many reactive partners compared to the few collaborative partners, the commitment and resources invested in the green issue are not equal. Some organisations want to be part of environmental collaboration to preserve their reputation, while others are willing to risk potential capabilities and resources that are competitive advantages for the betterment of the environment. The transparency in relational investment is further reinforced during the formalising of environmental objectives and the monitoring of environmental practices. This is a new contribution in this research, which needs further exploration from a network relational perspective (de Almeida, 2020). Therefore;

*P3:5B: Transparency in relational investment integrates like-minded stakeholders towards a stronger green alignment for environmental collaboration in the supply network.*

#### 7.2.3.6. Authenticity in Green Supply Alignments

Authenticity in green supply alignments refers to the sincerity and genuine intent of partners who have formed an environmental collaboration. This is supported by the sub-theme of authentic intent to collaborate in green claims. The significant difference between transparency and authenticity is that the former relies on being open and accessible, while the latter is about sincerity and genuine intent (Brun et al., 2020; de Almeida, 2020). For example, partners in the supply network can provide open and accessible information, but this doesn't mean they are sincere in their intent to make the necessary realignments for an environmental collaboration.

Authentic intent to collaborate refers to a supply network's sincerity in redeveloping and making changes to the coordination of environmental collaboration for the future. Collaborating partners might provide transparent information to validate the green claims, however they must be sincere and genuine in addressing customer's scepticism about green promotion. The fine line between transparency in relational investments and authentic intent dictates the level of commitment, resources, and capabilities that

the partners contribute during the collaboration. Not many partners are sincere and genuine in raising an industry's green standards, while others would be interested in solving immediate but less challenging green issues. Furthermore, partners who demonstrate authentic intent to collaborate will invest in sub tier suppliers and share resources to solve regional issues that might not have a direct return on investment. This new understanding needs further exploration in the supply chain literature. Therefore;

*P3:6A: Authentic intent to collaborate integrates the sincerity of green alignments in overcoming challenges during environmental collaboration in the supply network.*

Authenticity in green claims is another relational factor that requires further investment in terms of the sincerity and genuineness of collaborating partners. Since green knowledge is still in the research and development phase and is fragmented throughout the supply chain, it results in a lot of misinformation (Mehdikhani & Valmohammadi, 2019). Authenticating green claims requires extra effort from the supply network so as not to mislead the validity of the environmental collaboration. Authenticity in green claims occurs throughout green organisational orientation and environmental collaboration. This requires green conscious leaders to be investigative, while supply networks need to be more authentic in their intent to collaborate. Associations also play a critical role in identifying the misinformation that exists in the supply network, as they have a lot of information from an industrial perspective. Authenticity in green claims require validation and consistent information sharing in the reporting and monitoring phases of an environmental collaboration. However the authenticity of green claims has been alluded to in recent blockchain technology, and the relational component needs further attention from scholars (Janssen, Weerakkody, Ismagilova, Sivarajah, & Irani, 2020). Therefore;

*P3:6B: Authenticity in green claims validates the information and claims made throughout environmental collaboration in the supply network.*

## 7.3 Contribution to Knowledge

This research contributes and extends the body of knowledge about environmental collaboration in the supply chain literature. It discusses four important aspects. Firstly,

this research furthers the existing knowledge on the precursors of environmental collaboration, which are identified as top management, green policy, environmental management systems and commitment (Ahmed et al., 2020; Trujillo-Gallego et al., 2021). This research responded to the call of the literature to qualitatively explore the precursors of environmental collaboration as a green organisational orientation (Govindan et al., 2019). Green organisational orientation drives environmental collaboration through green conscious leadership, forming a green organisation, and assessing plausible green practices. This study confirms that the current academic literature that green organisational orientation is an antecedent of environmental collaboration that drives the commitment and momentum of environmental collaboration in the supply network (Jahanshahi & Brem, 2018). However, the natural resource based view that underpins this study aided in recognising the resources and capabilities needed in the organisation to drive environmental collaboration (Hart, 1995). Complementary to the existing knowledge, green conscious leadership has emerged as a significant resource and capability that is needed to drive the adoption of environmental collaboration in an organisation (Ilyas et al., 2020). However, the role of green conscious leadership is also significant in authentically encouraging and empowering an organisation to adopt more green conscious behaviour (Teixeira, Jabbour, de Sousa Jabbour, Latan, & de Oliveira, 2016).

The research provides some distinctions regarding the current management knowledge about green organisations (Aboelmaged & Hashem, 2019). In this research, forming a green organisation was important in facilitating the adoption of environmental collaboration in the supply network. An organisation structure, its employees and a culture that is receptive to green conscious behaviours and attitudes is more likely to adopt a collaborative behaviour with a supply network to address green issues (Luu, 2018). Although this has been well researched in management literature (Bowen, 2000), this research further extends to the knowledge that green organisational structuring, the understanding of stages of environmental concern and developing a green culture are in fact precursors of environmental collaboration in the supply network. Forming a green organisation is a soft resource, and the capability needed by organisations to better align their receptiveness and green consciousness with likeminded partners forms an easier environmental collaboration. This research provided a new contribution

to the environmental concern phenomenon, often researched empirically, to understand customer's levels of concern for the environment (Garai et al., 2018). In this research, it emerged that different stages of environmental concern exist within organisations which by understanding the exact stage in which the organisation is concern about their environment helps expect their commitment, objective, and resilience during environmental collaboration.

Assessing plausible green practices emerged as the point in which considerations to attain partners for collaboration occurs. This research extends the current knowledge about the importance of green tactical approaches, the compromises involved in developing a green product, the incorporation of green processing, the value appraisal of green orientation and the concerns of green promotion, which are all precursors of environmental collaboration. These strategic capabilities can be further categorised as pollution prevention, product stewardship and sustainable development (Hart, 1995). When consideration which strategic capability would be best to be adopted, this research contributes to existing knowledge that during consideration of environmental collaboration the trade-off of attaining or forgoing competitive advantage influences the organisations' decision making (Vaccaro & Karjaluoto, 2009). This research also supports the theoretical rationale of a natural resource based view that transitions between each strategic capability and can be incremental and progressive (Hart, 1995; Hart et al., 2010). For example, in this research most of the green tactical approaches and the incorporation of green processing began as pollution prevention and product stewardship capability.

However, during compromises of developing a green product and concerns of green promotion, organisation's collaboration with the supply network strengthens which positively influences their other capabilities to be elevated towards a sustainable development. The themes identified as the antecedent of environmental collaboration are strategic capabilities that can implemented concurrently as pollution prevention or product stewardship capabilities but to build a momentum and commitment towards environmental collaboration which eventually the strategic capabilities should be elevated to sustainable development. Finally, this research supports the rationale of a natural resources based view that attaining a strategic capability in sustainable

development is not the end of the collaboration; rather that these capabilities revert to being pollution prevention or product stewardship capabilities over time (Hart, 1995). Through innovation and research and development and elevated collaboration in the industry, strategic capabilities need to be refined to attain sustainable development (Hart et al., 2010).

Secondly, this research responds to the call of the literature in exploring the operational and relational components of environmental collaboration from a qualitative perspective (Asif et al., 2020; Ho et al., 2019). By taking a qualitative and grounded method in exploring environmental collaboration, this research extends the current knowledge of the synchronisation of the operational and relational components of environmental collaboration. The natural resources based view aided in identifying the internal strategic capabilities needed to drive environmental collaboration (Hart, 1995). The inter-organisational relational view underpinned the strategic capabilities needed in a network for collaboration to be successful (Dyer & Harbir, 1998). The operational strategic capabilities this research contributes to the body of knowledge are restructuring the supply network and coordination to contribute to environmental collaboration. Both themes emerged as relational investments that are needed to provide governance in the collaboration process (Dyer et al., 2018).

This research further supports the phenomenon that the structure of supply networks is formed organically and the alignments, information, knowledge shared in the chain are often lost in the “black box” stages of the chain (Fawcett, Fawcett, et al., 2012). This research therefore supports the academic knowledge about redesigning the supply network towards a lean approach to provide some transparency in the collaboration process (Brun et al., 2020; McDowell, Peake, Coder, & Harris, 2018). The seven step coordination of environmental collaboration that emerged in this research has extended the academic knowledge that operational activities when collaborating need governance in order to become coordinated (Anantaram Balakrishnan & Joseph Geunes, 2004). The seven step coordination of environmental collaboration also detailed the knowledge sharing routines and complementary resources that are needed in the supply network (Dyer & Harbir, 1998). This research further contributes to the existing knowledge that green organisational orientation drives environmental collaboration

through the operational activities of restructuring the supply network and coordinating environmental collaboration.

This research explored environmental collaborations through interviewing existing collaborative partners, where the defining partner roles emerged as the point of synchronisation of the governance of operational to relational investments needed during collaboration (Dyer & Harbir, 1998). Distinctive roles emerged for suppliers, manufacturers, and logistics that shed light on the strategic capabilities that are unique to their role and needed for environmental collaboration. This research supports the nuances that recently emerged in the supply chain literature, which shows that environmental collaboration occurs in a network of partnerships and needs to be explored from a network perspective (Batt & Purchase, 2004; Herczeg, Akkerman, & Hauschild, 2018). Each partner has a distinct strategic capability that is needed to continue the momentum in environmental collaboration. Thus, exploring a collaboration forms a focal company's perspective in a dyad or triad partnership, but doesn't shed light on the enormity, breadth and depth of the collaboration needed to attain a green, sustainable or circular economy (Asif et al., 2020). For example, the retailer's role in providing information about green product demand to suppliers is important when addressing the gap between green products and the demand for them, as highlighted in the literature (Shao & Ünal, 2019). Moreover, logistics provide more than green transportation and reverse logistics capabilities, as their connectivity to global supply networks can facilitate an integration across supply networks.

Finally, by building a theory we explore environmental collaboration through a myriad relational lens. This research contributes to the supply chain literature in that industry environmental collaboration is needed to encompass the full potential of attaining green issues at micro and meso level in the supply network. The economic trade off evident for organisations when implementing green practices is well supported in this research and in current supply chain knowledge (Um & Kim, 2019), hence attaining economies of scale through industrial environmental collaboration is needed to make green practices affordable. This research extends the current body of knowledge that competitor coopetition for environmental objectives is necessary to elevate the green standards and practices within an the industry (Govindan et al., 2019). Associations

emerged as a new finding worth further scholarly attention. The association's role in moderating supply chain environmental collaboration and liaising with government on green policies helps facilitate industrial environmental collaboration. Therefore, part of coordinating a collaboration is recognising the non-supply chain partnerships that can facilitate the momentum of the collaboration process. Hence organisations should recognize that the relational assets needed to facilitate the operation of environmental collaboration are considerably important (Adem, Childerhouse, Egbelakin, & Wang, 2018; Dyer et al., 2018). The sustainable development of environmental collaboration resides in the alleviation of collaboration from a supply network to the industry.

Thirdly, this research explored environmental collaboration in the supply chain as a network of relationships, which has been the call from the supply chain discipline several times (Davis-Sramek, Hopkins, Richey, & Morgan, 2020; He & Sun, 2020). Currently, the supply chain literature takes a quantitative method in measuring collaboration between dyad or triad partnerships (Miemczyk et al., 2012; Tipu & Fantazy, 2018). However a supply chain is made up of a myriad of partnerships across various regions and industries (Rezaei Vandchali et al., 2020), so it is important to understand collaboration from a network perspective as that reflects the reality of collaborative behaviour in existing value chains (Peng et al., 2020). The relational factors that emerged in this research were establishing green supply alignments, dynamic power asymmetries, trust in green supply alignments, communication in a green supply network, transparency in sharing green resources and capabilities, and authenticity in green supply alignments. The relational factors that emerged bind together the green organisational orientation and environmental collaboration in the supply network. This research extended the interorganisational relational view that relational qualities are dynamic in nature, such as the need to continue investment, assessment and moderation to grow and mature over time (Dyer et al., 2018).

This research concurred with the current academic literature that alignment in collaboration is important and needs a synchronisation of common values and objectives (Huang & Li, 2018). However, from a network perspective, this research provides an elevated perspective of the importance of alignment through recognising the stages of the environmental concerns of the partners, and coordinated steps needed

to structure an environmental collaboration. This also concurred with current academic knowledge about dependency and coercive power, which can be evident during a collaboration (Hingley et al., 2015). However, from a relational network perspective, third party moderation by associations can facilitate the collaboration towards a positive synchronised power balance. Trust emerged as being evident in the supply network, due to existing operational collaborations (de Almeida, 2020); however, trust in a partner's commitment in times of failure emerged as being more important, as it contributes to the maturity, knowledge and experience in the collaboration. Communication was explored, considerably in terms of its importance in facilitating relational knowledge sharing in the supply chains (Mendoza-Fong et al., 2018). The findings of this research in terms of forming communication channels and communicating green knowledge extends current academic knowledge by building the means and purpose for supply networks to environmentally collaborate (Fischer, 2013). Transparency and authenticity are still in the preliminary stages in the academic literature (Brun et al., 2020; de Almeida, 2020). This thesis contributes to the existing literature the idea that transparency and authenticity are needed to validate the genuinely in the claims and intentions that exists in the supply network. The strength and momentum of the supply network in an industry environmental collaboration requires an open and accessible sharing of information that projects sincerity and the genuine claims evident in production. However, dynamic relational factors need continuous development, attention and moderation as the collaboration matures through time.

Finally, this research has provided an inductive conceptual framework that demonstrates the inception and evolution of environmental collaboration. It concurs with the theoretical rationale of a natural resource based view and an interorganisational relational view (Dyer et al., 2018; Hart et al., 2010). As, theoretically, supported environmental collaboration is in a state of continuous development, this requires strategic capabilities in operational governance and relational assets for commitment throughout its progression in the supply chain and industry. The lack of moderation and common green issues faced in the supply chain calls for the further development of environmental collaboration from an industry perspective. The refinement of the environmental collaboration process needs the involvement of

partners to improve the strategic capabilities evident internally, and externally, and then with associations towards industry collaboration.

## 7.4 Implications for Managers

The findings of this research have implications for managers in the following three ways. Firstly, organisations that wish to pursue environmental issues can utilise the green orientation themes. The green conscious leadership clearly identifies the influence role managers have in pursuing green issues within an organisation. Forming a green organisation can help senior managers identify the structural and cultural attributes of their firm, which facilitates the adoption of green issues by internal stakeholders. Through applying the stages of environmental concern, organisations can assess a starting point for their internal stakeholders to adopt green issues. Moreover, they can strive to grow through the stages as a benchmark of striving for further green orientation. Finally, through assessing plausible green practices, organisations can apply the green practices that best suits their internal resources and capabilities. These findings reveal that an incremental progression of adopting green practices is the best tactical approach in building resilience over time to overcome the uncertainties, risks, and trade-offs in attaining green issues. However, organisations that want to begin collaborating on green issues can begin engaging with supply chain stakeholders when incorporating green processing.

Secondly, this study shed light on the dimensions of the supply chain and of industrial environmental collaborations. At a supply chain level, managers can create a lean supply network, coordinate environmental collaborations, and identify partner roles. This provides organisations with a roadmap on how to begin an environmental collaboration with partners. It also helps to create an effective governance of environmental collaboration in a socially and economically complex network of relationships. It is through supply chain collaboration that organisations can share resources, capabilities, and knowledge effectively in solving green issues that are complex and costly. Over time, the knowledge and expertise of the firms are further developed to build resilience.

Managers should strive to expand their supply chain environmental collaborations towards an industrial collaboration through coopetition with competitors and

associations as facilitators and moderators. Many of the challenge's organisations face, such as high investment costs, lack of economies of scale, and reduced green production can be attained through industrial environmental collaborations. Industrial environmental collaboration aggregates the efforts of multiple supply networks to solve industry specific green issues. A united and aggregated industry has more bargaining power with councils and governments when co-developing policies that are tailored to solving industry needs. Through aggregation in the industry on the moderation of associations, the social issues facing the partners in the sub tiers of the value chains can also be addressed.

Thirdly, relational factors provide an overarching relational benchmark that helps strengthen environmental collaboration. In establishing green alignments, it provides managers with an understanding of how to choose partners for collaboration. More importantly, identifying that external partner, whether it be in recycling, waste management or product stewardship, programmes can perform functions that are cheaper than adopting reverse logistics or green manufacturing. Dynamic power asymmetries provide managers with the understanding that evolving power asymmetries is not a barrier to environmental collaboration. Rather the synchronisation of power asymmetries can be done through a cultural alignment of partners. Trust in green supply alignments provides organisations with the understanding that trust in commitment and relational recovery is particularly important in an environmental collaboration. In fact, environmental collaboration is a path full of uncertainties, trade-offs, and risks, which results in a higher possibility of failure. Hence trust in sharing failures is important when building knowledge and expertise.

Communication in a green supply network is a core instrumental relational attribute that is needed to drive environmental collaboration. Managers can form communication channels and use them to communicate green knowledge. The communication channels also help in the integration of information and knowledge. Communicating in a green supply network is instrumental in aggregating the supply network towards an agreed green issue. Transparency in sharing green resources and capabilities helps managers understand that as much as receiving and integrating information and knowledge from others in the supply network is important, they too must be more open and provide

access to the information and resources they possess. The accessibility and openness of resources and capabilities helps clarify those collaborative partners that are truly committed to the attainment of green issues. The partners with an ingenuine intent can be filtered, since they are not committed to truly providing access when sharing resources and capabilities for the purpose of attaining green issues. Finally, authenticity in green supply alignments helps managers established genuine and sincere intentions in pursuing environmental collaboration for the betterment of the environment. More importantly, transparency and authenticity help organisations validate green claims in their promotions, which allows them proof in the face of customer scepticism. In conclusion, the findings of this research help managers to understand their level of investment in an environmental collaboration and their future benchmark and the importance of continuous development and realignments needed throughout the collaborative process.

## 7.5 Implications for the Furniture Industry

This research was conducted in the context of the furniture industry in New Zealand and Australia. The implications help to address some of the challenges organisations experience in this industry. The challenges facing the furniture industry are the high domestic labour cost of manufacturing, labour shortages, cheap imports, forests sold to private organisations and the lack of government moderation (*National Environmental Standards for Plantation Forestry: Overview of the regulations*, 2017).

Firstly, the supply chain in the furniture industry of Australia and New Zealand is highly fragmented. For both the Australian and New Zealand governments, the dairy Industry is prioritised, due to its high economic influence on the country's GDP (Beukes, Gregorini, Romera, Levy, & Waghorn, 2010). However, the policies that support the dairy industry negatively influence the forestry industry (Kirschbaum et al., 2013). For example, both Australia and New Zealand have provided incentives for farmers to clear forestry lands to cultivate dairy farms, which is a rich carbon emission industry (Dymond, Ausseil, Ekanayake, & Kirschbaum, 2012). Hence, the government's support of the dairy industry has led to the forestry industry becoming fragmented. Collaboration in the supply chain with an association's moderation is the exact solution needed in the forestry industries in Australia and New Zealand. In both countries, the participants felt

the government did not support sustainable issues, including environmental, social and economic concerns (Gregory A. Steward & Anthony E. Beveridge, 2010). In this way, collaboration amongst supply networks, with the moderation of associations, could influence the government's awareness and attention to the needs of the primary industries in the furniture industry.

Secondly, the fragmentation and lack of government support in the furniture industry has left private investors from foreign countries to purchase forestry lands from vulnerable farmers who need economic welfare (Marchi et al., 2018). The farmers often sell their young trees to private investors, who then ship the logs for lower manufacturing costs overseas (Warsito et al., 2020). By selling the logs early in their lifecycle, sustainable logging has been reduced and domestic manufacturing negatively impacted (Hartini et al., 2019). The findings of this research could help retailers and manufacturers recognise the importance of collaborating with domestic suppliers for a reduced carbon value chain, as well being as in support of the domestic economy for sustainable production.

Thirdly, the dumping of waste in New Zealand is monopolised by a selected few private organisation (Marchi et al., 2018). Therefore, the cost of dumping is $10 per tonne, which is being increased to $60 per tonne by 2024 (Lennox & van Nieuwkoop, 2010). The low cost of dumping has influenced inaction and the compliance of organisations to recycle or use waste management (MarketLine Industry Profile, 2017). Furthermore, the low cost of dumping and high labour costs has also influenced an organisation's lack of economic incentive to implement reverse logistics to remanufacture the furniture at its end of life (Karmaker et al., 2021). The aggregation of the supply networks through environmental collaboration can put pressure on the government to create policies that create an incentive for organisations to use appropriate waste management and recycling methods to dispose of their waste.

Fourthly, cheap imports of products have been increasing in New Zealand and Australia, which fuels the production and consumption of disposable furniture (Daian & Ozarska, 2009; Hartini et al., 2019). Environmental collaboration in the supply network helps aggregate the suppliers and manufacturers in the furniture industry to support increased sustainable production at an economy of scale. The involvement of

associations liaising with a government could also elevate the importance of imposing tax on those imports to preserve domestic production in the furniture industry. Furthermore, this research helps shed light on the importance of collaborating in green promotional campaigns to restore a customer's trust in green marketing and to increase the demand for green products.

Fifthly, many of the primary industries and suppliers in Australia and New Zealand already comply with the environmental standards set out by the ISO Certifications (Zimon et al., 2020). However, manufacturers and retailers in Australia and New Zealand also collaborate with cheaper suppliers in China, Malaysia and Indonesia (Ng & K, 2012; Profile, 2018). This has caused domestic suppliers to have inconsistencies in their contracts, which influences their social wellbeing (Khan, Zkik, et al., 2021). Through environmental collaboration, the supply network becomes aggregated, which helps in addressing the social issues that face the domestic sub-tier suppliers to the furniture industry. The exchange of economic well-being for environmental and social performance elevates the domestic sustainable production of the industry, and produces a lower carbon footprint in the value chain (Shoukohyar & Seddigh, 2020). Finally, this research has shed light on the importance of environmental collaboration in an industry. It provides a theoretical framework that could be used by associations and industry leaders to aggregate their supply networks through environmental collaboration. The dynamic power that exists in the economic performance of supply networks for domestic production could pressure the government in elevating the green standards through policies that solve industry needs for the betterment of the environment.

## 7.6 Limitation of Research and Future Research

This research used a qualitative research method in exploring environmental collaborations. Therefore, the findings are limited to the methodological approach of the research. However, these limitations yield the possibility of future research.

Firstly, recruitment for interview was conducted between January 2020 and March of 2021. During this time the corona virus pandemic had affected several countries around the world. During the recruitment process therefore, many potential participants

removed themselves from participating as they were focusing on maintaining economic performance and resilience in their supply chains. Therefore, if the study was done pre-pandemic and post-pandemic the participant's insights towards attaining green issues might have been different. However, on a positive note the participants who were still environmentally collaborating despite the uncertainties and risks of the pandemic showed genuine commitment and sincerity in pursuing green issues. Therefore, the findings of this research are limited to a sample of participants who were genuinely devoted to pursuing green issues with their supply network partners. However, this proposes that an opportunity for future research to be conducted post pandemic could focus on an organisation's resilience and commitment to environmental objectives, or on their environmental collaboration processes during extreme economic pressures. There is also an opportunity for future research to use a longitudinal methodological design to substantiate the theoretical framework that emerged in this study over time. Furthermore, a longitudinal methodological study in the future could empirically measure the transition of environmental collaboration from the supply network to the industry.

Secondly, the findings are bound by the attributes and properties of the of 21 participants in the furniture industry in Australia and New Zealand. Hence, the study is bound by the industrial, economic, social, and cultural norms of Australia and New Zealand. For example, the cheap imports of furniture from China have considerably influenced the participant's economic investment in green issues. If the study was to be replicated in other countries, the findings might be different. Future research should qualitatively explore the collaboration perspective of governments. Understanding a government's perspective could bridge the gap between the industry and supply chain environmental collaboration.

Thirdly, the dairy industry, which is a rich carbon emission industry, is highly protected by the governments of Australia and New Zealand. This has caused the environmental and social issues in the furniture industry and the associated primary industries to not be prioritised. The policies that protect the dairy industry are contradictory to the forestry industry Thus, the primary industries involved in the furniture industry are highly fragmented and influenced by direct foreign investments. This proposed that the

limitations in the findings of this research are bound by government policies, industry attributes and the market structure in Australia and New Zealand. If this research was conducted in countries such as Indonesia, Malaysia, or Russia, where the forestry industry has a significant economic imperative for the government, then the policies would support environmental collaboration in the supply networks. Future research could explore an industry comparison of different countries with pro green policies versus countries with reduced green policies to understand the different environmental collaboration processes undertaken in each supply network.

Fourthly, the findings of this research are themes that were interpreted inductively using thematic and cross comparison approaches. Hence, the influences of green organisational orientation, environmental collaboration and relational factors are not quantified statistically. The conceptual framework of the research cannot be empirically tested to identify the statistical significance of each proposition. However, this is an opportunity for future research to explore the empirical measurement of the theoretical conceptual framework that emerged in this research.

The final limitation is that the findings of this research are bound by the limits of a grounded theory methodological approach. A grounded theory methodological approach aims to inductively assess a substantive theory through thematic and cross comparison analysis. Therefore, the processes, actions and interactions in the themes emerged are prioritised. If the research is replicated in a narrative, case study or a phenomenological methodological method, the findings will be different. Hence the conceptual framework presented is limited to a grounded theory research method in the context of the furniture industry. However, future research could explore the theoretical framework proposed in this study in a service-based supply network to understand if the propositions can be replicated. The relational factors that emerged could be replicated in a service based environmental collaboration process to understand if the themes bear the same influence in the supply network.

Future research opportunities exist for scale development for some the nuances that emerged in this research. These include understanding the stages of environmental concerns, assessing plausible green practices, a seven-step coordination in environmental collaborations, and the relational factors in a network setting. The scale

development of such themes could further contribute to the scholarly literature in terms of empirically measuring the influence of green orientation in environmental collaborations. Future research could also empirically explore the concerns of green promotion in a myriad of collaborative partners supply network with retailers driving the campaign. This could yield further understanding about the need for a green marketing campaign throughout the supply network to increase customer demand. The influence of industry environmental collaboration on green production and attaining economies of scale needs further qualitative and empirical exploration. Future research could explore or compare two supply networks collaborating at an industry level to understand the influence and magnitude of industrial environmental collaboration on green production and attaining green issues.

Finally, relational networks propose a myriad of future opportunities. Firstly, green alignments, trust, power, and communication have been explored in the supply chain literature. However, environmental collaboration is an uncertain and risk assertive process with many opportunities for error. Future research could explore these relational factors in the context of collaborative supply networks after times of failure. Exploring relational recovery post failures could yield interesting results for understanding the recovery of supply networks during times that require resilience. Secondly, transparency and authenticity need to be further explored as relational factors in supply networks for operational and environmental collaborations. Although the blockchain literature has addressed transparency in the supply chain, the inter organisational relational attribute of transparency and authenticity needs to be comprehensively explored.

## 7.7 Conclusion of Thesis

This thesis took a grounded theoretical approach in exploring environmental collaboration in the supply network of the furniture industry in Australia and New Zealand. The aim was to respond to the call of the supply chain literature in taking a qualitative lens to explore the precursors that drive environmental collaboration in a network of collaborative partners. The theoretical framework emerged from inductive, thematic, and cross comparison analyses of the 21 participants (suppliers, manufacturers, logistics people, retailers, and associations) who are currently

collaborating in environmental objectives in the supply chain. The precursors of a green organisational orientation, which still drives environmental collaboration, emerged as a green conscious leadership, the formation of a green organisation, and assessing plausible green practices. The components of environmental collaboration emerged as restructuring the supply network, coordinating environmental collaboration, and defining partner roles in supply chain environmental collaboration. In industry environmental collaboration, the supporting themes were found to be competitor environmental coopetition and an association's role. The relational factors that bind the efforts of green organisational orientation and environmental collaboration together are establishing green supply alignments, dynamic power asymmetries in the supply network, trust in green supply alignments, communicating in a green supply network, transparency in sharing green resources and capabilities, and authenticity in green supply alignments. The theoretical underpinning of the natural resource-based view is extended when identifying the internal strategic capabilities, that are pollution prevention, product stewardship and sustainable development. The interorganisational relational view underpins the continuous development of the relational factors needed to continuously mature and evolve the environmental collaboration, from the supply chain to industrial advancements. This research developed a theoretical framework that could help the furniture industry to aggregate its supply network when addressing the environmental issues, it is facing. The aggregation of the supply network through environmental collaboration will help pressure the governments of Australia and New Zealand to provide pro green policies that address the industrial issues in the furniture industry. The substantive theoretical framework could aid future research to empirically explore environmental collaboration in other industries.

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# Appendices

## Appendix A: Literature Table of Environmental Collaboration

| No. | Arthurs- Tittle | Type of Study | Independent Variable | Dependent Variable | Key Findings |
|---|---|---|---|---|---|
| 1. | Fadeeva (2005)- Promise of Sustainability Collaboration- Potential Fulfilled? | Conceptual | Deregulation, Ideology, Policies, Beliefs, credible commitment, clarity of goals, clearly distributed responsibilities, involvement of relevant stakeholders, setting targets, monitoring progress, using incentives | Sustainable Collaboration | It is important to consider the socio-cultural and legislative when contexts considering collaboration. Legislative context influences the collaboration, green knowledge, and commitment of stakeholders to collaboration. |
| | Vachon and Klassen (2008)- Environmental management and manufacturing performance: The role of collaboration in the supply chain | Qualitative and Empirical- environmental collaboration amongst manufacturers of package printing industry in North America (Canada and United States). 6 plant visits, 6 semi structured interviews with plant managers. 84 surveys to 366 plants with 90 employees. | Prior performance, plant size, parent company size, age of presses, reinvestment rate, supply base and customer concentration | Environmental collaboration with Suppliers and customers | Environmental collaboration is defined as the joint environmental planning activities and cooperation in finding solutions to environmental challenges. Environmental collaboration has significant positive impact on manufacturing and environmental performance. External stakeholders such as customers and distributors are critical in the implementation of ISO-certified environmental management system and the organisation's compactivities. |
| 2. | Albino et al. (2012)- Do inter organisational collaborations enhance a firm's environmental performance? A study of the largest U.S. Companies. | Empirical- Survey of 500 companies in the U.S 2010's Newsweek Green Ranking | Environmental collaboration with suppliers, customers, other companies, NGO's, government, university, and research institutions | Environmental performance- Newsweek Green Score, Environmental Impact Score, Green policies score, Reputation Survey Score | Costs and risks of environmental collaboration is evident between all independent variables. Collaboration with government, NGO's, customers, and suppliers have a positive impact on environmental performance. However, collaboration with universities and research institutes has a negative impact on reputation. This could be due to perception of green washing to maintain reputation. |
| 3. | Hsueh (2012)- Collaboration on Corporate Social | Empirical- Bilevel programming and | Corporate Social Responsibility collaboration between 3 suppliers and 1 retailer. | Maximising total supply chain profit, improving CSR | Corporate social responsibility collaboration increases the profit of the supply chain. The bilevel programming model proposes CSR performance |

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| | Responsibility between Suppliers and a Retailer | variational inequality. 3 Suppliers and 1 retailer | | performance level and each supply chain actor benefits from the CSR collaboration | level, product quantity, selling price and profit are important variable to identify the CSR collaboration problem in a supply chain. |
| 4. | Cosimo. Rota, Nikolai. Reynolds, and Cesare. Zanasi (2013) | Conceptual | Supply chain collaboration, sustainable relationship | Sustainable performance | Sustainable collaboration and relationship are the pillar for sustainable performance. Sustainable performance consists of economic, environmental, and social performance. This is influenced by transaction cost economies, supply chain management and resources-based view. |
| 5. | Wu and Lin (2013)- Effects of buyer influence and green supply-chain readiness on environmental performance: The mediating role of environmental collaboration | Empirical- Survey of 253 manufacturers in the electrical and electronics industry in Taiwan. | Buyer influence, green supply chain readiness, environmental collaboration (moderator) | Environmental Performance | Green supply chain readiness is more influential than buyer's influence for environmental collaboration. Hence, green supply chain management needs resources, capabilities, knowledge of environmental management, manager support, environmental management system, financial and human resources. These have a significant influence on environmental collaboration that leads to environmental performance. |
| 6. | Blome et al. (2014)- Supply chain collaboration and sustainability: A profile deviation analysis | Empirical- Survey of 259 European manufacturing firms. | Misalignment, Sustainable production (moderation/mediation) | Sustainable performance, market performance | Alignments between supply chain initiatives improves sustainable and market performance mediated by sustainable production. Precursors of sustainable collaboration is needed to be explored. |
| 7. | Flint and Signori (2014)- Environmental Sustainability and the Supply Chain: Is Collaboration Necessary? | Qualitative- Phenomenology, inductive analysis of semi structured interviews of 110 senior managers in the global wine industry. | Survival market motivators- low customer demand for sustainability, over capacity, competitive pressure.<br>Sustainable motivators- in the blood, DNA, driving vision, association certification mandates, regulatory requirements, distribution partner requests. | Resolution Approaches- stimulates/find customer demand, market differential advantage, justify efforts as reducing costs and producing higher quality products, trying to align supply and demand expectations. | The meaning of sustainable collaborations is different dependant to the organisation's orientation. Sustainability in the supply chain is a journey that involves internal and external influences. The internal influences are critical to drive commitment for sustainable supply chain. One critical component of sustainable supply chain management is the commitment and influence of leader's perspectives on collaboration. Some leaders commit to collaboration for financial survival while others don't participate in it due to lack of economic investment. |

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| 8. | Ding (2014)- Supply chain collaboration toward eco-innovation: An SEM analysis of the inner mechanism | Empirical- 306 survey of project leaders of technology firms in electronics, IT, bioscience, advanced manufacturing, and new power firms. | Supply chain collaboration, Collaborative innovation capability (mediator), internal R&D capability (moderator) | Eco-innovation performance. | Supply chain collaboration has a significant positive impact on eco-innovation performance that needs information sharing, decision synchronising, incentive alignment and resource sharing between enterprises. Internal R&D moderates the impact of innovation capability and eco-innovation. R&D is significant to fuel innovation to sustain environmental challenges during collaboration. |
| 9. | Ramanathan et al. (2014)- The role of collaboration in the UK green supply chains: An exploratory study of the perspectives of suppliers, logistics and retailers. | Qualitative- 2 case study, 16 semi-structured interviews of Indian companies and middle managers. Company published sources. | Stakeholder pressures- buyer's pressure, legislations, government incentives, suppliers' pressure. | Internal collaboration- production plan, organisations planning team, purchase, and sales team.<br>External collaborations- raw material, warehouse, logistics, buyers, local country council, sales partners | Information sharing is critical for supply chain collaboration. This is particularly important as the operations of the supply chain is across various regions. There are three levels of collaboration to improve sustainability including production, supply, distribution, material, and technology. All level of collaboration can be implemented with upstream or downstream supply chain partners. |
| 10. | Chen et al. (2015)- Moderating effect of environmental supply chain collaboration- Evidence from Taiwan | Empirical- 205 Taiwanese companies in the stock market in the chemical, electrical, semiconductor, optoelectronic, computers and peripheral equipment, communications, and internet industries | Corporate environmental strategy- environmental management strategy, green product strategy,<br><br>Environmental collaboration in supply chain (moderator)- environmental collaboration with suppliers,<br>Environmental collaboration with customers | Competitiveness – Environmental- related cost reductions, differentiation | Corporate environmental strategy positively influences competitiveness. Environmental collaboration with suppliers positively moderates the relationship between corporate environmental strategy and competitiveness. Competitive sustainable supply chains require strategy and relational collaboration that needs the commitment of internal and external actors. |
| 11. | Chin, Tat, and Sulaiman (2015)- Green supply chain management, environmental collaboration, and sustainability performance | Conceptual | Green supply chain management practices- green procurement, green manufacturing, green distribution, green logistics,<br>Environmental collaboration (moderator) | Sustainability performance- economic performance, environmental performance, social performance | Establishing long terms collaborative relationships with supply chain actors strengthens the practices of GSCM in influencing the sustainable performance. |

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| 12. | Gunasekaran et al. (2015)- Green supply chain collaboration and incentives: Current trends and future directions | Conceptual | Green benefits,<br>Green relationship, green integration, green practices, | Green collaboration research framework: green transactions, green cooperation, green coordination, and green collaboration | Future investigations:<br>Understanding relational attributes during collaboration<br>Exploration of government policies in green food supply chains and perishables.<br>Developing analytical and simulation model for operational level decision making during collaboration<br>Influence of global operational factors on green collaboration.<br>Influence of cloud computing, green logistics practices on collaboration<br>Developing multi criteria model for different green practices in multiple supply chains.<br>Identifying the manufacturing roles during collaboration with relevant sample size and more geographical coverage. |
| 13. | Hellström, Tsvetkova, Gustafsson, and Wikström (2015)- Collaboration mechanisms for business models in distributed energy ecosystems | Qualitative-Case study of 3 energy companies | Ecosystem transition need:<br>Investment uncertainty, lack of business capability, need for cost optimization, low value offering.<br><br>Design of collaboration mechanisms based on:<br>Incompatibilities of old business models and new ecosystems functioning and goals,<br>Need for filling new roles in the target business ecosystem. | Establishment of target business ecosystem:<br>New roles of companies, renewed business model, increased collaboration and interdependency, generation and capturing of system value. | Collaboration mechanisms facilitate innovation in the business model to connect the supply chain actors. Different collaboration mechanism connects with various business models to develop a boundary spanner for the collaborative ecosystem to occur. |
| 14. | Ho and Lu (2015)- Performance implications of marketing exploitation and exploration: Moderating role of supplier collaboration | Empirical- 220 survey of Singaporean manufacturers and logistics | Marketing exploitation and exploration, supplier collaboration, market volatility, market competitiveness, absorptive capacity | Market performance relative to competitors | Organisation's pursuing marketing exploitation and exploration concurrently negatively impacts the firm's market performance. However, supplier collaboration positively impacts the organisation's commitment to marketing explorations but negatively impacts marketing exploitation on market performance. |

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| 15. | Hsueh (2015)- A bilevel programming model for corporate social responsibility collaboration in sustainable supply chain management | Empirical- Bilevel programming model | Corporate social responsibility performance level of supplier, manufacturer and retailer, transaction quantity between supply and manufacturer,<br>Transaction quantity between manufacturer and retailer, compensation transferred between supplier and manufacturer, compensations transferred between manufacturer and retailer. | Corporate social responsibility performance level of the supply chain | Supply chain collaboration improves performance of corporate social responsibility both for individual supply chain actors and the whole supply chain. |
| 16. | Grekova et al. (2016)- How environmental collaboration with suppliers and customers influence firm performance: Evidence from Dutch food and beverage processors | Empirical- Survey of 139 Dutch food and beverage processors | Regulatory pressure, market pressure, environmental management system, collaboration with suppliers, collaboration with customers, sustainable process improvements (mediator) | Cost savings, market gains | Environmental collaboration with suppliers positively influences the performance of processors and reduces costs. However, environmental collaboration with suppliers doesn't influence internal sustainable process improvements. While environmental collaboration with customers does indirectly influence sustainable process improvements through market pressure to get market gains. |
| 17. | Macchion et al. (2016)- Improving innovation performance through environmental practices in the fashion industry: The moderating effect of internationalisation and the influence of collaboration | Empirical- Survey of 125 Fashion manufacturers. | Environmental practices, Supply chain collaboration, Level of distribution in foreign countries (moderation), level of production in foreign countries (moderations) | Innovation performance | Environmental practices positively influence innovation performances however the influence of foreign countries negative impacts the supply chain collaboration for innovation performances. Level of production in foreign countries doesn't influence environmental practices or supply chain collaboration for innovation performance. Overall supply chain collaboration positively influences innovation performance. |
| 18. | Sancha, Gimenez, and Sierra (2016)- Achieving a socially supply chain through assessment and collaboration | Empirical- Survey of 120 Spanish Manufacturers | Assessment, collaboration | Supplier's social performance, buying firm's social performance | A scale development of assessing social performance with integration of social reputation and wellbeing. Through assessment of supplier's social measurements, collaboration strengthens the social performance of the supplier. |
| 19. | Chen, Zhao, et al. (2017)- Supply chain collaboration for sustainability: A literature review and future agenda | Systematic Literature review- Review of literature from 1987 to 2015 with key words supply chain, | - process integration, process management, cross functional coordination.<br><br>- supplier collaboration, supplier development, supplier integration, supplier | Internal collaboration, Collaboration with suppliers, Collaboration with customers, | Future research:<br>-integrating all 3 dimensions of sustainability,<br>- considering other supply chain entities like competitors and NGO's,<br>-adopting qualitative methodologies, |

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| | | collaboration, and sustainability | relationship governance, communication with supply chain partners, supplier monitoring, logistical and technological integration, supplier involvement, collaborative planning, green purchasing, trust, infrastructure, integrated supply chain management practices, sharing responsibility for product recovery/ penalties/ incentives.<br><br>- collaboration and coordination with customers, communication with supply chain customers, customer integration, trust, infrastructure, integration, monitoring by customer, logistical and technological integration, integrated decision making,<br><br>- collaborative capacity sharing, joint production. | Collaboration with competitors and other organisations. Supply chain collaboration for sustainability, economic sustainability, environmental sustainability, social sustainability. | -understanding the relationship, education, communication, and shared responsibilities.<br>- Applying stakeholder theory<br>- understanding the compliance of procurement partners<br>- understanding code of conduct of collaboration<br>- understanding the influence of collaboration and circular economy |
| 20. | Irani et al. (2017)- Enabling sustainable energy futures: Factors influencing green supply chain collaboration | Systematic Literature Review- 255 Articles based on articles on knowledge management, supply chain management, green supply chain management, supply chain collaboration, | - Strategic impact, strategic supply chain partnership, supply chain strategy and alignment<br>- Management/commitment support, management skills & knowledge, supply chain management style,<br>- Effective supply chain communication, interdependence in supply chain, organisational culture,<br>- Supply chain integration, supply chain systems information quality, supply chain collaboration design,<br>- Supply chain sustainability, environmental uncertainties, embodied energy, | Strategic, managerial, organisational, technological, environmental, financial, human-socio, operational. | The technological, strategic, operational, organisational, and financial factors are intercorrelated to make green supply chain collaboration to occur. At the core of this mechanism is the knowledge management and communication that exits between each factor. |

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| | | | - Supply chain costs and risks, green purchasing, supply chain performance,<br>- Supply chain member's commitment, employee training and education, interpersonal trust,<br>- Reverse logistics, supply chain agility, supply chain transparency | | |
| 21. | Niesten et al. (2017)- Sustainable collaboration: The impact of governance and institutions on sustainable performance. | Special volume- 12 articles of interfirm collaboration for sustainable performance | Institution, governance structure: markets, collaboration, hierarchies. | Sustainable performance | Collaboration is a governance structure that facilitates sustainable performance in a supply chain. Institutional environmental exerts pressure for organisations to pursue collaboration for sustainable performance. However, if the institutional pressure is too much it hinders sustainable performance as organisations will outsource operations for economic imperatives. Investing in sustainable innovation is important to sustain the collaboration amongst supply chain partners. |
| 22. | Chiao, Xu, Zhou, and Fang (2018)- Supply chain collaboration, Agility and Performance: The Moderating Effect of Environmental uncertainty | Empirical- Survey of 172 manufacturers of the optoelectronic industry in Taiwan, China, and Hong Kong. | Supply chain collaboration, supply chain agility (mediator), supply uncertainty (mediator), demand uncertainty (mediator) | Supply chain performance | The relationship of supply chain collaboration and supply chain performance is mediated through supply chain agility. The supply and demand uncertainty influence the agility of the supply chain which impact the collaboration. |
| 23. | Aboelmaged (2018)- Direct and indirect effect of eco-innovation, environmental orientation, and supplier collaboration on hotel performance: An empirical study | Empirical- Survey of 102 hotel chains in Abu Dhabi and Dubai in United Arab Emirates. | Environmental orientation, supplier collaboration, eco-innovation (mediator), | Hotel performance | Institutional regulations and stakeholder pressures drives the adoption of eco-innovation. Eco innovation also mediates the environmental supplier collaboration on hotel performance. However environmental orientation for hotel performance is considerably positive with eco-innovation. |
| 24. | Michalski, Montes-Botella, and Narasimhan (2018)- The impact of asymmetry on performance in different collaboration and integration | Empirical- 66 companies in Spain. | Asymmetry, collaboration (moderation), integration (moderation), | Supply chain performance | The relationship between asymmetry and supply chain performance is ambiguous. This indicates that the relationship is not linear. Moreover, over collaboration and integration do positively and negative moderate asymmetry and supply chain performance. This denotes collaboration and |

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| | environments in supply chain management | | | | integration have a significant role in addressing this ambiguity in positive and negative manner. The ambiguity and unstable non-liner relationship show a reflection of the network-based partnerships that exits in the supply chain. These relationships can happen "naturally" and "temporal". |
| | Pakdeechoho and Sukhotu (2018)- Sustainable supply chain collaboration: Incentives in emerging economies. | Empirical – survey of 215 food manufacturing companies in Thailand | Sustainable supply chain collaboration,<br><br>Sustainable incentives (moderator)- Supply chain incentive, government incentives | Sustainable performance- economic, environmental, social performance | Sustainable supply chain collaboration positively influences social and economic performance in the supply chain. However, this is a negative relationship in terms of environmental performance. This is in line with previous literature that internal practices are needed to drive collaboration to attain environmental performance. Moreover, Asian countries like Thailand have reduced understanding and foresight on green supply chain management. Supply chain incentives do moderate sustainable collaboration and sustainable performance. However, government incentives didn't have the same effect. A reason for this relationship is that government incentives are given to one organisation rather than targeted to the whole supply chain. |
| 25. | Reficco et al. (2018)- Collaboration mechanisms for sustainable innovation | Qualitative – 31 interviews of green organisations. Case study. | Collaboration mechanism – economic, social, and environmental. | Enabling conditions: Organisational identity and DNA, organisational policies, focus on value co-creation, satisficing approach to value capture, fair pricing with suppliers, fair pricing with customers, acceptance of limits to growth, core capabilities, corporate social | Business models have a significant impact on the drive of collaboration mechanism. However environmental collaboration is more dependent on environmental knowledge, competencies sharing, environmental monitoring, joint production planning and industrial symbiosis and innovation. Social collaboration does drive economic and environmental performance. The enabling conditions facilitate the collaboration mechanism among supply chain partners. |

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| | | | | entrepreneurship, establishing business friendship relations, redirecting demand, | |
| 26. | Kashyap and Lakhanpal (2019)- A framework for assessing collaboration between buyers and suppliers on sustainability goals | Qualitative – Interview of 26 business professions in the Delhi, India. The byers, suppliers and consumers were interviewed. Focus group of 10 of the participants. | Sustainable buyer and supplier collaboration:<br>- Supplier's perspectives- environmental performance, social performance, operational performance, positive economic performance, negative economic performance, branding/positioning<br>- Buyer's perspective- improved productivity, financial performance, competitiveness, regulation<br>- Customer's perspective- awareness and knowledge, perception about green products, concern/beliefs about green products, green strategies, purchase intention, buying behaviour. | Sustainable practices of the focal company. | Taking a dyad relational perspective organisation should take into consideration the need and expectations of the partner during collaboration. Implementing corporate social responsibility policies with moderation of compliance with suppliers helps organisations collaborate easier. This also ensures the quality of sustainable goods and services to target customer's perception of green products. |
| 27. | Dora (2019)- Collaboration in a circular economy: Learning from the farmers to reduce food waste | Qualitative- Interview of 9 farmers in the food supply chain of UK. | - Collaborative supply chain relationships are key to achieving sustainability within circular economy,<br>- knowledge sharing is a means of supply chain collaboration<br>- local supply chain relationships facilitate collaboration<br>- it is critical to achieve mutual benefits in collaboration<br>- | Circular Economy | Supply chain collaboration in the context of sustainability does result in circular economy. However, the relational components of collaboration for mutually beneficial outcome are considerably important to achieve circular economy. |
| 28. | Mehdikhani and Valmohammadi (2019)- Strategic collaboration and sustainable supply chain | Empirical- survey of 271 manufacturers in Iran. | Strategic collaboration, external knowledge sharing (mediator), internal knowledge sharing (mediator) | Sustainable supply chain management- social, economic, environmental. | External and internal knowledge sharing positively mediates the relationship between supply chain collaboration towards sustainable supply chain management. However, supply chain collaboration |

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| | management: The mediating role of internal and external knowledge sharing | | | | is also positive significant with external and internal knowledge sharing. This indicates that knowledge sharing is an integrated part of supply chain collaboration. |
| 29. | Ahmed et al. (2020)- Analysing the impact of environmental collaboration among supply chain stakeholders on a firm's sustainable performance. | Empirical- Survey of 126 manufacturers in Pakistan implementing green supply chain management | Institutional pressures, customer monitoring, internal green supply chain management, supplier monitoring, customer collaboration, supplier collaboration, | Environmental performance, Financial performance, Operational performance, | Customer monitoring and institutional pressures positively influences the organisations adoption of internal green supply chain practices. This positive influence triggers organisations to collaborate with customers and monitor suppliers. ultimately achieving environmental and operational performance is positive through the influence of internal green supply chain management. However financial performance is not achieved as the costs incur for green practices is higher. |
| 30. | Alzoubi et al. (2020)- Empirical study on sustainable supply chain strategies and its impact on competitive priorities: The mediating role of supply chain collaboration. | Empirical- Survey of 175 pharmaceutical organisations in Jordan. | Sustainable supply chain strategies, supply chain collaboration (mediator), | Competitive Priorities | Supply chain collaboration mediates the sustainable supply chain strategies of the organisation towards competitive priorities. However, there is an internal drive for the organisation to pursue this as supply chain collaboration is needed for sustainable measures to be implemented. |
| 31. | Arora and Arora (2020)- Strategic sustainable purchasing, environmental collaboration, and organisational sustainability performance: the moderating role of supply base size | Empirical- Survey of 112 large manufacturers and 205 small manufacturers. | Strategic sustainable purchasing: strategic purchasing, environmental purchasing, Supply Base (Small vs. large) (moderator), environmental collaboration | Organisational sustainability performance: economic, environmental, and social performance. | Strategic sustainable purchasing positively impacts environmental collaboration in small supply bases. For large supply bases strategic purchasing positively impacts environmental collaboration, however this is not the case for environmental purchasing. This is due to large supply bases depending more on economic performance and hence put strategical and shared goals with economic incentives at the forefront of decision making. Moreover, opportunistic behaviour is more prevalent in large base supply chains. This study highlights the moderating role of supply bases on the choice of strategic sustainable purchasing for environmental collaboration. overall environmental collaboration does lead to positive |

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| | | | | | organisational sustainability performance measurements. |
| 32. | Bae (2020)- The relationships between orientation, collaboration, and performance for supply chain management of Korean FDI firms for Sustainable Growth | Empirical- Survey of 72 Korean FDI firms. | Orientation of supply chain management- Strategic orientation, Structural orientation.<br><br>Collaboration in supply chain management- inter departmental collaboration, collaboration with international logistics firms, quality performance, reliability performance, | Supply chain performance- flexibility and responsiveness performance, cost performance | Supply chain orientation has a positive impact on environmental collaboration, Collaboration has a positive influence on supply chain performance. However, collaboration is both interdepartmental and external. |
| 33. | Campos et al. (2020)- The effect of collaboration and IT competency on reverse logistics competency- Evidence from Brazilian supply chain executives. | Empirical article- Survey of 320 Brazilian supply chain executives. | Collaboration, IT Competency (moderation), Reverse logistics, | Economic, Environmental performance. | Collaboration positively influences reverse logistics competency. However, IT competency doesn't influence the relationship between collaboration and reverse logistics. However reverse logistics competency improves economic and environmental performances. |
| 34. | Hofman et al. (2020)- Supply chain collaboration and eco-innovations: An institutional perspective from China | Empirical- Survey of 220 Chinese manufacturers. | Regulatory pressures, market pressures, community pressures, customer collaboration, supplier collaboration, | Product eco-innovations, process eco-innovations | Community pressures does positively influence supplier collaboration with results in increases process eco-innovation. However, although market pressure positively influences customer collaboration it doesn't enforce product eco-innovation. Surprisingly regulatory pressures don't influence collaboration with customers or suppliers for innovation. |
| 35. | Lee and Ha (2021)- The impact of interactional justice and supply chain collaboration on sustainable SCM performance: The case of multinational pharmaceutical firms. | Empirical- Survey of 201 manufacturers. | Interpersonal justice, informational justice, supply chain collaboration, | Sustainable supply chain management performance | Interpersonal justice and informational justice have a positive influence on supply chain collaboration for sustainable performance of the whole supply chain. This sheds light on the importance of fair-trade and respectful environment needed to facilitate supply chain collaboration. |
| 36. | Trujillo-Gallego et al. (2021)- Identification of practices that facilitate manufacturing companies' environmental | Empirical- A survey of 43 Colombian manufacturing companies. | Internal environmental management, eco-design, green human resources, green information systems and technology, green marketing, reverse logistics, environmental | Green purchasing, green manufacturing, green distribution. | Internal environmental management, eco-design and green marketing have positive effect on environmental collaboration. however, green human resources, green information and systems |

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| | collaboration and their influence on sustainable production. | collaboration, control variables (company size, export orientation) | technology and reverse logistics had no influence on environmental collaboration. Environmental collaboration does positively influence green purchasing, green manufacturing, and green distribution. |

# Appendix B: Literature Table of Precursors of Environmental Collaboration

| No. | Arthurs | Sample | Independent Variable | Dependent Variable | Key Findings |
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| 1. | Gyöngyi (2005)- Supply chain collaboration for sustainability | Conceptual | High differentiation advantage with low productivity- Reputation.<br>Low differentiation advantage with low productivity advantage- Resistant adaptation<br>High differentiation advantage with high productivity advantage – eco-entrepreneur<br>Low differentiation advantage with high productivity advantage eco-efficiency | Sustainable collaboration based on differentiation and productivity advantage. | Understanding the environmental strategy portfolio that drives the commitment of organisations towards sustainable collaboration. The depth of collaboration requires further commitment from organisations in terms of sharing resources and capabilities. The scope of collaboration in the supply chain requires more strategic planning. The direction of environmental demand influences the depth and scope of sustainable collaboration in the supply chain. |
| 2. | Bradbury-Huang (2010)- Sustainability by Collaboration: The SEER Case | Conceptual- Redesigning the SEER Systems for sustainable collaboration | Carbon reduction, toxicity reduction, increase global and native ecosystem health, ethical engagement of stakeholders, partnership in organisational networks,<br>Leadership | Sustainable collaboration | Sustainable collaboration is a collaborative agency of the interconnection of conceptual, relational and action concepts. Conceptual perspective is the shared vision of the common frame of reference to the sustainable issue. Relational is the commitment and drive of collaboration through personal and professional relationships. Action is the working together towards a shared goal. |
| 3. | De Giovanni (2011)- Environmental collaboration in a closed-loop supply chain with a reverse revenue sharing contract | Empirical- Differential game model. | Wholesale price, green advertising, returns residual value, administrative cost | Environmental collaboration and reverse logistics | Green advertising increases customer's knowledge and awareness on the return policy. This is critical to increase the demand for reverse logistics. The economic viability of reverse logistics is influenced by the large returns residual value and sharing parameter. |
| 4. | Green, Zelbst, Bhadauria, and Meacham (2012)- Do environmental collaboration and monitoring enhance organisational performance? | Empirical- Quantitative Survey 159 manufacturing managers. | Internal environmental management, green information systems, environmental cooperation with suppliers, environmental cooperation with customers, environmental monitoring of suppliers, environmental monitoring of customers, | Environmental performance, organisational performance | Environmental collaboration and monitoring practices with suppliers and customers positively influence environmental and organisational performance. |
| 5. | Jean, Sinkovics, and Kim (2014)- The impact of technological, organisational, and environmental | Empirical- Survey of 240 Taiwanese based electronics | Technological context- IT advancement., Organisational context- customer orientation, buyer dependence., Environmental context- context of culture, environmental uncertainty | Electronic collaboration, relational performance | Understanding the precursors of electronic collaboration and its positive influence on relational performance. IT advancements are critical for innovation needed in electronic collaboration and relational performance. |

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| | characteristics on electronic collaboration and relationship performance in international customer-supplier relationships | manufacturing equipment. | | | |
| 6. | Theiben et al. (2014)- Reducing the carbon footprint within fast moving consumer goods supply chains through collaboration: The Manufacturers Perspective | Qualitative- Semi structured interview of 5 top and middle managers of manufacturers. | Absorptive capacity, Incentive alignment/goal congruence, trust, experience in the network management, compatibility of systems and processes.<br><br>Mediators: Carbon emission management expertise, carbon emission reduction objective, presence in environmental indices | Organisation's readiness to engage in collaborative carbon reduction management | Manufacturers at a more mature stage in sustainability pursue the objective of interorganisational carbon reduction and select similar aligned partners. More mature manufacturers gain greater relative power in their relationships are they are better able to gauge suppliers' claims and capabilities to leverage already established frameworks. Downstream customers drive collaborative carbon reduction management from the value chain. Six stages of collaborative carbon reduction management include defining goals and initial assessment of potential partners, identification of potential supply chain partners, interorganisational communication building, interfacing with partners, driving the relationship, and measuring success. |
| 7. | Dangelico and Pontrandolfo (2015)- Being "green and competitive": The impact of environmental actions and collaborations on firm performance | Empirical- Survey of 122 Italian companies. | Capabilities to implement environmental actions- energy, pollution and materials focused.<br>Capabilities to develop environmental collaboration- collaboration with business and non-business actors. | Firm performance- market and image performance. | Organisations market performance is positively impacted by the capabilities to implement environmental actions to combat energy and pollution. These capabilities also allow the organisation to have environmental collaboration with supply chain actors and non-business partners. However, the organisational image performance is positively impacted by the capabilities to implement environmental actions on a focus of materials and developing environmental collaboration with non-business actors. |
| 8. | Laari et al. (2016)- Performance outcomes of environmental collaboration- Evidence from Finnish Logistics service providers | Empirical- Survey of 311 logistics providers in the Transport Industry of Finland. | Internal environmental collaboration, external environmental collaboration | Operational performance, Financial Performance | External environmental collaboration with customers is positively significant with improving operational and financial performance. However, further research is needed to validate the influence of internal environmental collaboration on operational and financial performance. |

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| 9. | Pero et al. (2017)- Environmental collaboration for sustainability in the construction Industry: An exploratory study in Italy. | Qualitative- case studies of 8 sustainable construction firms in Italy. Semi structured interviews of sustainable, environmental, or quality control managers | Practices in design process- life cycle assessment, eco-designing, training on eco-designing.<br>Practices in purchasing process- supplier selection, sustainable suppliers rating, green material purchasing,<br>Governance- sustainability oriented partnership, organisation's roles devoted to sustainability, training on sustainability, ethical code. | No environmental collaboration with low control of processes- not sustainable.<br>Low Information sharing with low control processes is partially sustainable<br>High information sharing with high control processes partially sustainable.<br>High collaboration with high control processes fully sustainable. | Collaboration between organisations exists within the synchronisation of their strategic orientation, level of key processes (design, purchasing, building), collaboration design and collaboration in purchasing. This is also in relevance to the amount of information shared during collaboration. Considering a typological perspective there are three approaches to environmental collaboration including fully, partially, or not sustainable. |
| 10. | Silvestre, Monteiro, Viana, and de Sousa-Filho (2018)- Challenges for sustainable supply chain management: When stakeholder collaboration becomes conducive to corruption | Qualitative- Case study, observation of the Brazilian beef supply chain from 4 manufacturers. | Supply chain management, stakeholder collaboration, corruption, Managerial orientation, and environmental turbulence (influencing mediations) | Reduced sustainability performance. | There are dark sides to stakeholder collaboration is that it influences others in the supply chain to engage in corruption. A triangular corruption exists between business representatives, politicians, and regulatory agencies. |
| 11. | Allaoui, Guo, and Sarkis (2019)- Decision support for collaboration planning in sustainable supply chains | Conceptual- 55 papers indicating 3 bottom line dimensions. | Planning- strategic, tactical, operational.<br><br>Added decision making- exact methods, meta-heuristics, multi-criteria methods, game theory<br><br>Collaboration- vertical and horizontal collaboration, sharing consolidation, multi-modality | Sustainability – economic, environmental, social | The decision support systems help organisations collaborate for sustainable supply chains. The decision support systems aggregate information and communication technology to support the simultaneously collaboration across the network and provide supply chain visibility. |
| 12. | Dania et al. (2019)- An integrated collaboration framework for sustainable sugar supply chains | Conceptual | - Inputs: Collaboration behavioural factors<br>Drivers:<br>- Stakeholder assets: capital, materials, workforce, machines, infrastructure<br>- Stakeholder capabilities: Research and Development, quality control, policy and legislations, finance, technology, operation, and distribution. | Good collaboration Quality, Common goal.<br>Outputs: economic, environmental, and social benefits. | Recognising the boundaries in which collaborative mechanism can concur between partners. This is an integrated collaboration model that could be adapted for sustainable supply chains. |

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| | | | - Stakeholder Roles- farmers, distributors, miller<br>- Collaborative values, sharing activities, adaptation, trust, power, stability, commitment, continuous improvement, coordination, joint efforts.<br>Sustainable requirement:<br>- Economic, social, and environmental requirements<br>- Economic, social, and environmental context | | |
| 13. | Asif et al. (2020)- Adoption of green supply chain management practices through collaboration approach in developing countries- From literature review to conceptual framework | Systematic literature review- 25 papers of collaboration and green supply chain management from 2008 to 2019. | Themes across green supply chain management:<br><br>Drivers: government, customers, suppliers, performance, stakeholders, NGO's certifications, cost advantage, going green, employee involvement, top management pressure, CSR,<br>Practices: certifications, customer collaboration, green manufacturing, green purchasing, green employee training, green supply, government regulations, eco-design, reverse logistics, closed loop supply chain, eco-inventory management, green marketing, supplier evaluation. | Collaboration with suppliers, competitors, improved environmental performance | Future research:<br><br>- Further research on FDI trends and impact of green supply chain management practices.<br>- Understanding the barriers of adoption of green supply chain management<br>- Understanding internal drivers of green supply chain management and collaboration<br>- Further expansion of monitoring and assessment methods during collaboration.<br>- Development of measurement tools and methods for accurate measurement of environmental performances<br>- Expansion of green supply chain management and collaboration on different industrial sectors<br>- Frameworks of implementing green supply chain management in developing vs developed countries<br>Conceptual and qualitative methods on collaboration and reflection of mindsets. |
| 14. | Lee and Joo (2020)- The impact of top management's support on the collaboration of green supply chain participants and | Empirical- Survey of 301 companies that are establishing | Top management support, collaboration with suppliers (moderators), collaboration with customers (moderators), | Environmental performance | Top management support positively influences environmental performance. This relationship is positively moderated through collaboration with suppliers and customers. This research validates the important role of top management support achieving environmental performance through collaboration. |

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| | environmental performance. | green supply chain. | | | |
| 15. | Bouguerra et al. (2021)- How do agile organisations contribute to environmental collaboration? Evidence from MNE's in Turkey. | Empirical- Survey of 249 managers and 66 multinational enterprises in Turkey. | Operational agility, individual creativity (mediator), flexible work arrangements (mediator) | Environmental collaboration | Individual creativity and flexible work positively mediate operational agility on environmental collaboration. This indicates that agility, creatively and flexible work is important to result in innovation needed for environmental collaboration. |
| 16. | Govindan, Aditi, et al. (2021)- Structural model for analysis of key performance indicators for sustainable manufacturer- supplier collaboration: A grey decision-making trial and evaluation laboratory-based approach. | Empirical- survey of 12 managers. | Identified Key performance indicators: Pollution prevention, environmental management system, pollution controls, returns handling capability, green image, environmental competencies, recycling, environmental costs, information disclosure, training education and community education, employment practices, occupational health and safety management system, interests and rights of employees, work health and safety, | Sustainable collaboration with suppliers | The KPI's do positively influence environmental collaboration. The most prominent KPI's are information disclosure and environmental management systems that highly influences sustainable collaboration with suppliers. Hence, this research proposes that to attain supplier sustainable collaboration it is important to encourage information disclosure, empower environmental management systems jointly and focus on the group of KPI. |
| 17. | Trujillo-Gallego et al. (2021)- Identification of practices that facilitate manufacturing companies' environmental collaboration and their influence on sustainable production. | Empirical- A survey of 43 Colombian manufacturing companies. | Internal environmental management, eco-design, green human resources, green information systems and technology, green marketing, reverse logistics, environmental collaboration, control variables (company size, export orientation) | Green purchasing, green manufacturing, green distribution. | Internal environmental management, eco-design and green marketing have positive effect on environmental collaboration. however, green human resources, green information and systems technology and reverse logistics had no influence on environmental collaboration. Environmental collaboration does positively influence green purchasing, green manufacturing, and green distribution. |

# Appendix C: Literature Table of Relational Factors of Environmental Collaboration

| No. | Arthurs | Sample | Independent Variable | Dependent Variable | Key Findings |
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| 1. | Paulraj, Jayaraman, and Blome (2014)- Complementarity effect of governance mechanisms on environmental collaboration: does it exist? | Empirical- 259 survey of firms practicing in green initiatives and listed in the US Institute for Supply Management | Relational governance- structural: long-term relationship orientation. Process- inter-organisational communication, inter-organisational teams. Environmental collaboration | Environmental and Social performance | Structural mechanism mediates process mechanism to considerably influence relational governance of environmental collaboration. Environmental collaboration mediates environmental social performance. Relational precursors are critical for environmental collaboration and requires further exploration. |
| 2. | Sheu (2014)- Green Supply Chain Collaboration for Fashionable Consumer Electronics Products under Third-Party Power Intervention- A resource dependence perspective | Empirical- 271 Survey of retailers and manufacturers in the fashionable consumer electronics products in Taiwan. | Third party power intervention - Driven political power, third party power intervention- driven social power, interdependence, power asymmetry reduction, collaborative relationship (mediator) | Green supply chain performance | Third-party power intervention positively reduces the power asymmetry between partners. This enhances the collaborative relationship between dyadic partners which leads to green supply chain management. This power intervention reduces the environmental uncertainties of actors. |
| 3. | van Hoof and Thiell (2014)- Collaboration capacity for sustainable supply chain management: small and medium-sized enterprises in Mexico | Empirical- Survey of 177 suppliers in the Mexican sustainable supply programme. | Collaboration intention, Operational routine, coordinative routine, | Communication routine | Suppliers' collaboration capacity is influences by the characteristics of the firms and managers. Collaboration influences the inter-organisational dynamics through knowledge absorption capacity, structuring solutions, motivating activity and mutual definition of cleaner production. Ultimately collaboration positively influences cleaner production. |
| 4. | Luo, Chong, Ngai, and Liu (2015)- Reprint of "Green supply chain collaboration implementation in China: The mediating role of guanxi". | Empirical- Survey of 222 Chinese manufacturing organisations. | Buyer- Seller Relationship- Asset specificity, volume uncertainty, transaction frequency, competitive environment<br><br>Guanxi, control variables. | Green supply chain collaboration implementation. | Buyer-seller relationship positively influence organisation's implementation of green supply chain collaboration via transactions and competitions. However, the more guanxi amongst supply chain actors reduces their willingness to collaborate. |
| 5. | Srivastava et al. (2015)- Relational Resource Precursors and Operational Outcome of | Empirical – 115 Survey of US manufacturing firms. | Resource complementarity, resource specificity, | Operational performance | Collaboration positively influences operational performance. Resource specificity and complementary are two of the precursors of collaboration. complementary resources coordinate partner activities under technological and market turbulences. |

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| | Supply Chain Collaboration: The role of environmental turbulence | | Technological turbulence, (moderation)<br>Market turbulence, (moderation) collaboration | | |
| 6. | Touboulic and Walker (2015)- Love, love me not: A nuanced view on collaboration in sustainable supply chains | Qualitative- semi structured interviews from 11 agricultural suppliers | Collaboration aspects- relationship history, shared values and goals, communication, commitment, participation, continuity/mutual expectations. | Relationship management for supply chain management- contractual agreements, implementation process and monitoring, problem resolution, sharing of benefits & risks, continuity/future expectations | Enablers from relational perspective:<br>1. investments in relation specific assets: relationship history, commitment of members, trust between members, desire to develop new knowledge.<br>2. knowledge exchange that includes joint learning: supplier development activities on sustainability such as training and assessment.<br>3. combining resources or capabilities leading to innovation: adoption of IT based tool to measure carbon emission, supplier expertise and environmental accreditations.<br>4. effective governance: top management support at the buying firm, supplier group structure for horizontal collaboration.<br><br>Lack of enablers from the relational theory perspective include:<br>5. Lack of investments in relation-specific assets: lack of visibility beyond 1st tier suppliers, lack of trust in authenticity of buyer's sustainability agenda.<br>6. Lack of knowledge exchange: limited grower's absorptive capacity related to environmental and social management, lack of two-way cooperation on sustainability issues, lack of informal communication, lack of environmental information sharing between competing suppliers.<br>7. Lack of combining complementary resources or capabilities: lack of financial resources to invest in sustainable technology, lack of standardised mechanisms to capture suppliers experience on the natural environment, lack of procurement skills to deal with sustainability questions.<br>8. Lack of effective governance: lack of informal governance mechanism to manage sustainability, lack of attention to suppliers' resistance, misalignment of time frame for achieving sustainable goals,<br>Barriers from relational theory perspective: |

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| | | | | | 9. Asset inter-connectedness: increasing dependence over loss of control in forgoing environmental and social data,<br>10. Partner scarcity: limited number of "good" suppliers who can comply with the requirements<br>11. Resource invisibility: perceived inequality of pain and gain sharing regarding sustainability, suppliers' resistance to change.<br>Institutional environment: geographic dispersion and isolation of suppliers, legislation on renewable energy as a disincentive to investment in agriculture |
| 7. | Scandelius and Cohen (2016)- Sustainability program brands: Platforms for collaboration and co-creation | Qualitative- Multiple case study of retailers, food/drink manufacturers and stakeholders. In-depth interviews of 20 organisations. | Firm interacts with suppliers, industry colleagues and employees. The sustainability program brand facilitates collaborative power, co-creation, knowledge sharing and innovation. | The sustainable progress is a continuous loop of development. | Communication is important to facilitate the collaboration and co-creation amongst stakeholders. The sustainable program brand platform helps facilitate the reporting of a two-way communication on sustainable objectives to collaborate one. |
| 8. | Petersen et al. (2017)- The ties that bind: How a collaboration deficit impedes the development of sustainable products | Qualitative- 32 in-depth interview of managers in the consumer goods industry. Grounded theory. | You can't do it alone, no one likes an opportunist, tighter but separate, old friends stick together. | Mutual dependence, leveraging power, leveraging relationships. | Collaboration for sustainable products occurs between long-lasting and well trusted relationships. However, embarking on new relationships with sustainability as a forefront of the agenda is not preferred or adopted by participants. Big organisations use their power to exert pressure on others in the supply chain to collaborate. Having control over significant supply chain functions such as production and operations provides organisations with more capability to initiate collaboration. internal organisation's commitment influences their drive towards collaboration with supply chain partners. |
| 9. | van der Heijden and Cramer (2017)- Change agents and sustainable supply chain collaboration: A longitudinal study in the Dutch pig farming sector from a sensemaking perspective. | Qualitative- Narrative. Interview of 12 pig farmers. With 3-hour observation of each farm. | Producer level of engagement:<br>- Communicating: local language, gain knowledge.<br>- Acting: recruitment, ecolabel, adapting regulations, joint investment, elimination of barriers.<br>- Building relationships: establishing informal and informative connections.<br>Chain level engagement: | Levels of collaboration: Producer level engagement, chain level engagement, beyond the chain partnerships. | Collaboration occurs in a multi-level perspective at a producer, chain and beyond the chain partnerships. The synchronisation of organisation's commitment to communication, practices and relationships facilitates the strength of environmental collaboration between actors. |

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| | | | - Communicating: strategizing the future, local language, gain knowledge,<br>- Acting: recruit new partners, setting up joint chain solutions, guarantee sustainable markets for demand, create quality agreements.<br>- Building relationships: Establishing informal collaborative connection, Invite NGOs for information sharing, arrange government support and measurement of success.<br>Beyond the chain partnerships<br>- Communicating: envision front runner role, local language, gain knowledge<br>- Acting: recruit beyond supply chain partners, increase scope, finance, and innovation, assist others in the chain.<br>Building relationships: formalise relationships with agreements and contracts, align with NGO's. | | |
| 10. | Awan et al. (2018)- Governing interfirm relationships for social sustainability: The relationship between governance mechanisms, sustainable collaboration, and cultural intelligence | Empirical- Survey of 239 manufacturers in Pakistan. | Contract governance, collaboration, cognitive cultural intelligence (moderator), meta cognitive cultural intelligence (moderator), behavioural cultural intelligence (moderator), motivational cultural intelligence (moderator). | Social performance | The relationship between contract governance and collaboration is strongly moderated by cultural intelligence. The higher the meta-cognitive cultural intelligence that exists the stronger the collaboration between partners. These findings are particularly important in extending the knowledge on the importance of understanding cultural tiers for a positive outcome of collaboration. |

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| 11. | Bae and Grant (2018)- Investigating effects of organisational culture and learning on environmental collaboration and performance of Korean exporting firms. | Empirical- 219 survey of Korean exporting firms who environmentally collaborate with global supply chains. | Organisational culture – time, commitment, communication, Learning capability – learning encouragement, learning systems, integrative mechanism | Environmental collaboration- Internal collaboration, supplier collaboration, customer collaboration, Environmental performance | Organisational culture and learning capability are precursors of environmental collaboration. However, there is no relationship between organisational culture and environmental collaboration this is partly due to the low level of employees understanding of green supply chain management. However, the commitment, trust and communication are more prominent during collaboration between firms. Organisations with high levels of learning capability tend to share their knowledge more with collaborative partners. Finally, environmental collaboration has a significant positive influence on environmental performance. |
| 12. | Dania et al. (2018)- Collaboration behavioural factors for sustainable agri-food supply chains: A systematic review | Systematic literature review- 30 articles of supply chain, value chain, sustainable collaboration. | Joint efforts- joint planning, joint problem solving, joint performance measurement,<br><br>Adaptation- Adaptation, compatibility of partner.<br><br>Sharing Activities- Information sharing, risk and reward sharing, resources sharing.<br><br>Collaborative values- interpersonal relationships, no blame culture, fluidity of collaboration, organisational task orientation, mutual understanding, relationship value<br><br>Coordination, stability, trust, commitment, power, continuous improvement. | Clusters of collaboration | Future research should pursue:<br><br>1. Understanding the behavioural factors that facilitate collaboration.<br>2. The influence and relationship between the clusters during collaboration.<br>Understanding the influence of sustainable collaboration on environmental, economic, and social performance. |
| 13. | Gölgeci et al. (2019)- A relational view of environmental performance: What role do environmental collaboration and cross- | Empirical- 270 Turkish companies | Relational capability, social capital, environmental collaboration, (mediates), cross-functional alignment (moderator) | Environmental performance, | Environmental collaboration mediates the influence of relational capability and social capital on environmental performance. Cross functional alignment of marketing and supply chain management functions strengthens the influence of relational capability on environmental collaboration towards environmental performance. Further research is needed to explore the influence of cross |

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| | functional alignment play? | | | | functional alignment and environmental collaboration in terms of environmental performance outcome. |
| 14. | do Canto et al. (2020)- Supply chain collaboration for sustainability: A qualitative investigation of food supply chains in Brazil | Qualitative- Interview of 27 supply chains | Reach: Mainly dense networks, favourable differences resources, activities, and consumers, unfavourable differences: sustainability orientation, size, and location.<br>Richness: rare resources of both chains, multiple suppliers and organic certifications, a niche of consumers willing to pay a premium of eco-innovative products, appropriability of size and bargaining power,<br>Most relationship are bilateral, non-traditional relationships have two main multilateral combinations.<br><br>Receptivity: great trust and commitment in both chains, long-term partnerships, personal ties help with receptivity. | Differences between chains:<br><br>- Chain alphas is more homogenous in terms of sustainability.<br>- Company alpha adds more value to grape by-products and has more access to consumers<br>- Company beta has more access to producers and infrastructure,<br>- Chain beta has a greater focus on social outcomes, chain alpha has a greater focus on environmental outcomes<br>Greater tier multiplexity in chain alpha | Supply chains are a complex network of relationships with great affinity that managerial orientations can influence. Managerial influence can also raise the environmental and social benchmark of the supply chain through collaboration which leads to eco innovation. |
| 15. | Feng et al. (2020)- The dual process between green supplier collaboration and firm performance: A behavioural perspective | Empirical- Survey of 206 manufacturing firms in China. | Green supplier collaboration, dependence on supplier (moderator), trust in supplier (moderator), information sharing (mediator), opportunistic behaviour (mediator), | Firms' performance, financial performance, and environmental performance | By increasing information sharing green supplier collaboration positively influences financial and environmental performances in the organisations. Opportunistic behaviour negatively influences environmental performance and has a direct negative impact on supplier collaboration. the dependence on supplier positively moderates the influence of green supplier collaboration and opportunistic behaviour Trust positively influences green supplier |

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| | | | | | collaboration and information sharing but negatively influences opportunistic behaviour. |
| 16. | Jazairy et al. (2021a)- Unravelling collaboration mechanism for green logistics: The perspectives of shippers and logistics service providers. | Empirical- Survey of 169 shippers and 162 logistics organisations in Sweden. | Controls: Size (no. of employees), green strategy, innovation strategy and service quality strategy.<br><br>Collaboration mechanism:<br>- Relation specific: asset specificity, customization, contract duration<br>Knowledge sharing: learning exchange, personal exchange, IT Integration | Green logistics practices: green model shifts, green transport management, green logistics systems, green vehicle technologies, eco-driving, alternative fuels, green warehousing, green packaging. | Both types of logistic organisations acknowledge the importance and relevance of both collaborative mechanisms. However, the choice of collaborative mechanism is depended on the objective, actors, and intentions of collaboration. Relational collaboration mechanism had a stronger positive influence on green logistic practices then knowledge sharing mechanism. |
| 17. | Jraisat et al. (2021)- Triads in sustainable supply-chain perspective: why is a collaboration mechanism needed? | Qualitative- Interview of 42 agriculture companies in a triad collaboration. Case study approach. | Contextual factors:<br>assets specificity- dependence on facilities, joint operation investment.<br>Uncertainty- supply chain complexity, product salience.<br>Frequency- age of dyad, choice of actor<br><br>Portfolio Triad's approaches:<br>Direct triad: price strategy, revenue sharing, total cost strategy.<br><br>Indirect chain: product flow, information flow and finance flow,<br><br>Contract market: formal contract, mixed contract, informal contract.<br><br>Informal sharing reduces from direct to contract market approach progresses. | Sustainability performance: economic, environment and social | Eight triad approaches occur in three levels based on the intensity of information sharing between actors. The six contextual factors influence the triad approaches and hence the level of information expected to be shared during collaboration. |

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| 18. | Kleine Jäger and Piscicelli (2021)- Collaborations for circular food packaging: The set-up and partner selection process. | Qualitative- Interview of 17 food companies operating in Europe. | A. Prerequisite:<br>1. Motivation to work on circular economy<br>2. Recognition of the need to collaborate<br>• Influencing factor: firm's size<br><br>B. Understanding:<br>3. Understanding the market and material flows<br>• Influencing factors: food type packaged, location of operation, Different collaboration types requires vertical/ horizontal networks, one-to-one alliance, knowledge exchange<br>4. Vision creation and alignment<br>• Influencing factor: hierarchy of strategies.<br>C. Preparation<br>5. Assessment of own capabilities and gaps<br>• Partner roles:<br>- Starting the project: Initiator, financier, internal educational<br>- Developing the project: circularity expert, market expert, piloter.<br>- Realising the project: use-phase supporter, end of life supporter, impact extender.<br>6. Internal team formation<br><br>D. Partner involvement<br>7. External outreach<br>8. Partner evaluation | Nine- step collaboration process. | The centrality of the collaborative process is the integration of processes and partner roles. Therefore, defining the actors' roles for the collaborative process helps the momentum of the supply chain towards circular economy. |

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| | • Partner characteristics:<br>- Generic partner characteristics: trustworthiness, complementarity, no negative reputation, advantageousness<br>- Circular economy specific partner characteristics: strategic fit, commitment, creativeness/ open mindedness, open communication, goals alignment.<br>E. Formalisation Agreements. | |

## Appendix D: Recruitment email

My name is Negin, a PhD candidate in the Marketing Department of Auckland University of Technology. My research aims to understand the impact of environmental collaboration in a supply chain in the Furniture and Hardwood Industry of New Zealand. Your organisation has been chosen based on its role as a retailer, manufacturer, supplier or logistic organisation in the Furniture and Hardwood industry of New Zealand with some implementation of sustainable and green practices. If you are interested in participating in this interview it will take no longer than 60 minutes at your preferred public location. Alternatively, a skype interview can be arranged as well. Any reference to your identity or organisation is confidential and anonymous. A detailed information sheet is attached to this email for your review. Ideally, we would like to interview senior or top managers that are responsible for the green or sustainable strategies of the organisation or supply chains. In exchange for your support, I am happy to provide you with a transcribed version of the interview and later a managerial report detailing the findings of the study. A sample of the questions that I would ask during the interview is listed below:

1. Are there any marketing strategies implemented by your organisation that can be considered as "green marketing strategies"?
2. In your experience what are some of the challenges of implementing green marketing strategies?
3. How have you extended this green behaviour within the organisational culture?
4. To what extent are you willing to collaborate with your supply chain partners to achieve environmental objectives?

If you are interested in participating, please respond to this email and I would arrange a time and date most convenient to you.

AUT

**Negin Ahmadi Saber Doust**
PhD Candidate and Teaching Assistant
Marketing, Advertising, Retailing & Sales
Auckland University of Technology

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# Appendix E: Information Sheet of Participants

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TE WĀNANGA ARONUI O TĀMAKI MAKAU RAU

## Participant Information Sheet

**Date Information Sheet Produced:**

16/08/2019

**Project Title**

The impact of Green Retailing Orientation on Environmental Collaboration within the Retail Supply Chain.

**An Invitation**

I am Ms. Negin Ahmadi Saber Doust, currently a PhD candidate in Auckland University of Technology in the Department of Marketing, in New Zealand. As part of my PhD candidature I am undertaking a research entitled the impact of Green Retailing Orientation on Environmental Collaboration within the retail Supply Chain.

**What is the purpose of this research?**

The purpose of this research is to understand the retailer led initiatives of environmental collaboration within their supply chain. The findings of this interview will provide practitioners a blueprint of initiating and adopting sustainable practices within their supply chain. The findings will provide organisations with empirical evidence to respond to environmental pressures as a collaborative approach with all stakeholders. Understanding the environmental collaborative approach within a supply chain will yield reduced cost and increased sustainable behaviour in the long term. Your valued contribution in this interview will either be in the perspective of the retailer, manufacturer, supplier or logistic organisation in the Furniture or Hardwood Industry. If at any time during the interview you no longer wish to proceed, please let me know. After which the voice recording of the interview will be deleted. Alternatively, if you are interested in keeping a copy of the interview a transcribed document will be emailed to you upon request.

**How was I identified and why am I being invited to participate in this research?**

The selection process of your organisation is based on your organisation being part of the market of Furniture and Hardwood Industry either as a retailer, manufacturer, supplier or logistic corporation. Also participants have been selected based on mentions of green or sustainable approaches in your websites. You have been recruited for this research based on your corporate position in the organisation as a CEO or senior manager who has executive decision in adopting environmental changes in the supply chain.

**How do I agree to participate in this research?**

After reading this information sheet, please sign the consent form provided by the interviewee. The consent form and data will be confidential and viewed by the researcher only. Your participation in this research is voluntary (it is your choice) and whether or not you choose to participate will neither advantage nor disadvantage you. You are able to withdraw from the study at any time.

**What will happen in this research?**

Your participation involves answering to open-ended questions in an interview. The interview will be recorded then transcribed. The common themes will be identified among the participants in support of the findings of the research.

**What are the discomforts and risks?**

At this stage no foreseeable discomfort or risk is determined. As a participant of this research, if for any reason you feel any discomfort or risk through the interview process please let the interviewee know.

**What are the benefits?**

The benefits of this study for you are in 4 aspects. First, retailers can identify how to initiate environmental collaboration within their supply chains. Second, managers can understand the different concerns stakeholders may have and how it can be utilised in a collaborative effort to solve the environmental objectives. Third, by addressing environmental concerns towards a collaborative effort, organisations can achieve sustainability with economic, environmental and social benefits. Lastly, organisations can achieve first mover advantages in attaining green branding benefits and avoiding green washing claims by governments and end user-customers. As a participant of this research you may request a summary of the interview for your personal use. Also, the managerial

report of the findings of the research can be provided to the participants upon request. The benefits of this study for the researcher is to again a PhD Degree.

**What compensation is available for injury or negligence?**

In the unlikely event of a physical injury as a result of your participation in this study, rehabilitation and compensation for injury by accident may be available from the Accident Compensation Corporation, providing the incident details satisfy the requirements of the law and the Corporation's regulations.

**How will my privacy be protected?**

The interview will be transcribed and processed with other participants to understand the common themes and concerns of the organisations in the industry. Any relevance to your personal identity will not be indicated in the research except a simple categorisation as a retailers, manufacturer, supplier or logistic firm in the Furniture and Hardwood Industry. The consent form with your details will be stored in a secured file cabinet in the property of the Auckland University of Technology in the Marketing Department.

**What are the costs of participating in this research?**

Participating in this research bears the cost of the participants time. No monetary costs are associated with the interview. The interviewee will accommodate in terms of meeting in offices and public spaces that is most convenient for the participants. The interview will be approximately 60 minutes.

**What opportunity do I have to consider this invitation?**

Accepting to participate in this research is contacting the interviewee via negin.ahmadi.saber.doust@aut.ac.nz . From the time this information sheet is provided to you until the acceptance of the invitation is until 31st December 2019.

**Will I receive feedback on the results of this research?**

The transcribed copy of the interview will be provided to participants upon request after the interview. Upon request the one page summary of the interview will be emailed to the participants. The managerial findings of this research will be emailed to participants upon request once it is finalised approximately in March of 2020.

**What do I do if I have concerns about this research?**

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Associate Professor Dr. Mark Glynn , mark.glynn@aut.ac.nz , and a 921 9999 x 5813. Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC, Kate O'Connor, ethics@aut.ac.nz , 921 9999 ext 6038.

**Whom do I contact for further information about this research?**

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:

### *Researcher Contact Details:*

Primary Interviewee: Ms. Negin Ahmadi Saber Doust, negin.ahmadi.saber.doust@aut.ac.nz

### *Project Supervisor Contact Details:*

Primary Supervisor: Associate Professor Dr. Mark Glynn, mark.glynn@aut.ac.nz and +64 921 9999 x 5813

Secondary Supervisor: Dr. Eunjoo (EJ) Han, eunjoo.han@aut.ac.nz and +64 921 9999 ex 6058

**Approved by the Auckland University of Technology Ethics Committee on *29 August 2019*, AUTEC Reference number *19296*.**

Appendix F: Consent form of Participants

AUT
TE WĀNANGA ARONUI O TĀMAKI MAKAU RAU

# Consent Form

*Project title: The impact of Green Retailing Orientation on Environmental Collaboration in retail Supply Chain.*

*Project Supervisor:* *Associate Professor Dr. Mark Glynn and Dr. EunJoo Han*

*Researcher:* *Ms. Negin Ahmadi Saber Doust*

- ○ I have read and understood the information provided about this research project in the Information Sheet dated 16th August 2019.
- ○ I have had an opportunity to ask questions and to have them answered.
- ○ I understand that notes will be taken during the interviews and that they will also be audio-taped and transcribed.
- ○ I understand that taking part in this study is voluntary (my choice) and that I may withdraw from the study at any time without being disadvantaged in any way.
- ○ I understand that if I withdraw from the study then I will be offered the choice between having any data that is identifiable as belonging to me removed or allowing it to continue to be used. However, once the findings have been produced, removal of my data may not be possible.
- ○ I agree to take part in this research.
- ○ I wish to receive a summary of the research findings (please tick one): Yes○ No○

Participant's signature: .....

Participant's name: .....

Participant's Contact Details (if appropriate):

.....

.....

.....

.....

Date:

***Approved by the Auckland University of Technology Ethics Committee on 29th August 2019 AUTEC Reference number 19296.***

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# Appendix G: Ethical Committee Approval

AUT

TE WĀNANGA ARONUI O TĀMAKI MAKAU RAU

## Auckland University of Technology Ethics Committee (AUTEC)

Auckland University of Technology
D-88, Private Bag 92006, Auckland 1142, NZ
T: +64 9 921 9999 ext. 8316
E: ethics@aut.ac.nz
www.aut.ac.nz/researchethics

29 August 2019

Mark Glynn
Faculty of Business Economics and Law

Dear Mark

Re Ethics Application: **19/296 The impact of green retailing orientation on environmental collaboration in retail supply chain**

Thank you for providing evidence as requested, which satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC).

Your ethics application has been approved for three years until 27 August 2022.

**Standard Conditions of Approval**

1. The research is to be undertaken in accordance with the Auckland University of Technology Code of Conduct for Research and as approved by AUTEC in this application.
2. A progress report is due annually on the anniversary of the approval date, using the EA2 form.
3. A final report is due at the expiration of the approval period, or, upon completion of project, using the EA3 form.
4. Any amendments to the project must be approved by AUTEC prior to being implemented. Amendments can be requested using the EA2 form.
5. Any serious or unexpected adverse events must be reported to AUTEC Secretariat as a matter of priority.
6. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the AUTEC Secretariat as a matter of priority.
7. It is your responsibility to ensure that the spelling and grammar of documents being provided to participants or external organisations is of a high standard.

AUTEC grants ethical approval only. You are responsible for obtaining management approval for access for your research from any institution or organisation at which your research is being conducted. When the research is undertaken outside New Zealand, you need to meet all ethical, legal, and locality obligations or requirements for those jurisdictions.

Please quote the application number and title on all future correspondence related to this project.

For any enquiries please contact ethics@aut.ac.nz. The forms mentioned above are available online through http://www.aut.ac.nz/research/researchethics

Yours sincerely,

Kate O'Connor
Executive Manager
**Auckland University of Technology Ethics Committee**

Cc: negin.ahmadi.saber.doust@aut.ac.nz; Eunjoo Han

## Appendix H: Interview Guide

1. Please explain your role, responsibility and how long have you been in this position?
2. Could you please explain about your environmental collaboration with supply network partners?
3. Could you please explain about your environmental collaboration with customers?
4. What has been the role of government during the environmental collaboration?
5. What has been your personal role during environmental collaboration?
6. What has been the role of your organisation during environmental collaboration?
7. What has been the role of partners during the environmental collaboration?
8. What has been your challenges during this process? How did you overcome them?
9. What did you need from your partners during the environmental collaboration?
10. What kind of information did you share with your supply chain partners regarding environmental practices?
11. What are the resources or capabilities you needed to implement an effective environmental collaboration?
12. How did you align your partners for collaboration? did you forgo any previous alignments?
13. How did you manage the alignments in the supply network for collaboration?
14. What are the benefits and costs you have had to become more sustainable?
15. What do you think is the steps towards organisations on becoming more sustainable?
16. Do you have any recommendations of other individuals/organisations that I should speak to?